

September/October 2009

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Space Exploration

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Front Cover: Astronaut Bruce McCandless is seen floating above Earth.

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Articles listed in *Article & Web Alert* are available at The American Library nearest to you. Should you wish to receive photocopy of any of the articles, please fill in the attached reply-paid card with your request and mail it to us. We shall mail you the requested articles. For your convenience, addresses of the four American Libraries in India are given on the inside front cover.

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Space Exploration

The entire world held its breath as the American astronauts blazed through Earth's atmosphere into outer space to land on the Moon four decades ago. It was a historic moment when for the first time humans set foot on another celestial body. Neil Armstrong, commander of Apollo 11, became the first man to land a craft on the Moon and the first man to step on its surface. To mark the 40th anniversary of the Apollo 11 moon landing, President Obama, on July 20, 2009, met Apollo 11 crew members—Neil Armstrong, Buzz Aldrin, and Michael Collins.

"That's one small step for a man, one giant leap for mankind," proclaimed Armstrong as he descended from his spacecraft on the lunar surface on July 20, 1969. Buzz Aldrin, who landed on the Moon shortly after Armstrong, described the lunar surface as "magnificent desolation." They explored Moon's surface for two and a half hours, collected samples, took photographs, and left behind an American flag.

National Aeronautics and Space Administration (NASA), which remains at the hub of U.S. efforts in aeronautics and space research, was created by the National Aeronautics and Space Act of 1958 (P.L. 85-568) to conduct civilian space and aeronautics activities. Since its creation, NASA has undertaken a wide variety of successful programs and projects including the Apollo landings on the Moon, the development of communications and weather satellites, the sending of planetary probes, and research in aeronautics that has improved aircraft performance and safety and assisted the competitive stance of the U.S. aeronautics industry. The agency has also encouraged international collaborations in space research. The largest cooperative effort in this direction is the International Space Station (ISS), where 15 nations share a common platform with the United States. ISS is an ambitious project that employs a permanently inhabited international space station in Earth's orbit with crews rotating on a regular basis.

Space exploration has always been a priority in the U.S. agenda. In 1972, President Nixon approved NASA's plan to create the first reusable launch vehicle, called the space shuttle. On January 25, 1984, President Reagan directed NASA to develop a permanently occupied space station within a decade and offered to invite other countries to join. On July 20, 1989, the 20th anniversary of the first Apollo landing on the Moon, President George H.W. Bush voiced his support for the space station as the cornerstone of a

long-range civilian space program eventually leading to bases on the Moon and Mars. In 1993, President Clinton dramatically changed the character of the space station program by adding Russia as a partner to this growing international endeavor. Prompted in part by the February 2003 *Columbia* space shuttle tragedy, President George W. Bush, on January 14, 2004, announced new goals for NASA—the Vision for Space Exploration, often referred to as the Moon/Mars program. He directed NASA to focus its efforts on returning humans to the Moon by 2020 and eventually sending them to Mars and the "world beyond."

Keeping pace with the momentum, the Obama Administration observed that the U.S. must maintain and take full advantage of its technical and strategic superiority in space. Among its proposed actions are closing the gap between retirement of the space shuttle and launch of the next generation of space vehicles; strengthening NASA's missions in space science, weather, climate research, and aeronautical research; helping establish a robust and balanced civilian space program, and engaging international partners and the private sector to amplify NASA's reach; re-establishing the National Aeronautics and Space Council, which will report to the President and oversee and coordinate civilian, military, commercial and national security space activities; and ensuring the freedom of space.

Apart from exploring possibilities of extraterrestrial life, space research programs have extended astonishing results for the wellbeing of mankind. Miniaturized integrated circuits, satellite technology, GPS navigation systems, bone-density measurements, miniaturized heart pumps, and several other technologies derived from NASA research and development have saved and improved human lives. Other spinoffs include water filtration systems that turn wastewater into drinkable water, wireless light switches, remediation solutions for sites contaminated by chemicals, and sensors on reconnaissance robots used in Afghanistan and Iraq to deal with improvised explosive devices. Beyond these, space tourism has also surfaced as an exciting possibility for private space exploration.

Space has always attracted human attention inviting them to explore its vast entity. Human efforts to understand, and reach beyond our current understanding is sure to continue in the future. Maintaining its momentum, NASA is working towards returning humans to the Moon no later than 2020. Altair will be the new Moon Lander for astronauts. It is the lunar lander spacecraft component of NASA's Constellation fleet. As of now, the Altair

lunar lander is scheduled to deliver up to four astronauts to the lunar surface, providing life support and a base for week-long initial surface exploration missions and then returning the crew to the Orion spacecraft that will bring them home to Earth.

The Obama administration recently approved the space vehicles and flight procedures now under advanced development. The next target after returning back to the Moon would be to explore Mars and other destinations across the solar system. Currently, NASA is also pursuing with its space shuttle program that is helping build the International Space Station (ISS), the world's largest orbiting laboratory.

NASA has several other ambitious projects in its pipeline. Solar Dynamic Observatory (SDO), the first space weather research network mission in NASA's Living With a Star Program, is scheduled to leave Earth in November 2009 onboard an Atlas V rocket. SDO is on a mission to study the sun in unprecedented detail. Onboard telescopes will scrutinize sunspots and solar flares using more pixels and colors than any other observatory in the history of solar physics.

In December 2009, WISE (Wide-field Infrared Survey Explorer) will be launched aboard a Delta II rocket. WISE is an unmanned satellite carrying an infrared-sensitive telescope that will provide a vast storehouse of knowledge about the solar system, the Milky Way, and the Universe. Glory spacecraft launch scheduled for October 1, 2010 is aimed at increasing our understanding of the Earth's energy balance by observing the Earth's aerosols and solar irradiance. Juno, the second spacecraft designed under NASA's New Frontiers Program with principal goal of understanding the origin and evolution of Jupiter, is scheduled for launch in August 2011 and arrive at the giant planet in 2016.

The articles included in this section encompass several components of space exploration and offer detailed discussion on a wide array of issues including various space missions, enhancement in space technology, current status and potential possibilities in this exciting field of study.

For additional information, a webliography is presented here for your use. The inclusion of Internet sites other than those of the U.S. government should not be construed as an endorsement of the views contained therein. The websites are current as of publication date and are subject to change at any time.

America.gov: To Work and Play in Space
<http://www.america.gov/space.html>

Astronomy: Teaching and Learning Resources
http://free.ed.gov/subjects.cfm?subject_id=49&ctoplvl=48

The Carnegie Observatories
<http://www.ociw.edu/>

Center for Space Science and Exploration
<http://www.lanl.gov/csse/>

Deep Space Network (DSN)
<http://deepspace.jpl.nasa.gov/dsn/>

Federal Aviation Administration: Gateway to Space
<http://www.faa.gov/news/updates/?newsId=59611>

The future in space
http://home.fnal.gov/~carrigan/pillars/Space_future.htm

Gemini Observatory
<http://www.gemini.edu>

The Giant Magellan Telescope (GMT)
<http://www.gmto.org>

Griffith Observatory
<http://www.griffithobs.org>

Harvard-Smithsonian Center for Astrophysics
<http://www.cfa.harvard.edu/>

Hubble Space Telescope
<http://www.centennialofflight.gov/essay/Dictionary/HST/DI196.htm>

Kansas Cosmosphere and Space Center
<http://www.cosmo.org>

Kennedy Space Center
<http://www.nasa.gov/centers/kennedy/home/index.html>

Large Synoptic Survey Telescope (LSST)
<http://www.lsst.org>

Mars Society
www.marssociety.org

McDonald Observatory
<http://www.as.utexas.edu/mcdonald/mcdonald.html>

The Michigan State University Campus Observatory
<http://www.pa.msu.edu/astro/observ/>

MMT Observatory
<http://www.mmt.org>

Moon and Mars
<http://spaceflight.nasa.gov/mars/>

Mount Wilson Observatory
<http://www.mtwilson.edu/>

The National Academies: Project Information on Aeronautics
& Space Engineering Board
<http://www8.nationalacademies.org/cp/ReportView.aspx?key=Board>

National Aeronautics and Space Administration (NASA)
www.nasa.gov

National Optical Astronomy Observatory
<http://www.noao.edu>

The National Science Foundation: Astronomy & Space
<http://www.nsf.gov/news/overviews/astronomy/index.jsp>

The Office of Science and Technology Policy
<http://www.ostp.gov>

Oklahoma Space Industry Development Authority
<http://www.okspaceport.state.ok.us/index.html>

Palomar Observatory
<http://www.astro.caltech.edu/observatories/palomar/>

Space Adventures, Ltd.
<http://www.spaceadventures.com/>

Space Florida
<http://www.spaceflorida.gov>

Space Foundation
www.spacefoundation.org

Space Frontier Foundation
www.space-frontier.org

Spaceport America
<http://www.spaceportamerica.com>

SpaceTalk
<http://www.unc.edu/space/>

StarChild: A Learning Center for Young Astronomers
<http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html>

U.S. Centennial of Flight Commission
<http://www.centennialofflight.gov>

U.S. Department of State: Space & Advanced Technology
<http://www.state.gov/g/oes/sat/>

The U.S. Space & Rocket Center
<http://www.spacecamp.com/museum/>

United Space Alliance
<http://www.unitedspacealliance.com>

Women in Astronomy 2009
<http://wia2009.gsfc.nasa.gov>

Yerkes Observatory
<http://astro.uchicago.edu/yerkes/>

1. ARMY ASTRONAUTS

By Heike Hasenauer. *Soldiers*, v. 63, no. 10, October 2008, pp. 20-25.

This article provides insight into life as an American astronaut, including its author Colonel William McArthur Jr. Active-duty and retired soldiers of the NASA's Astronaut Detachment are among some 90 astronauts at the Johnson Space Center in Houston. They are today's space pioneers charting new frontiers as they work to complete construction of the International Space Station. For those who aspire to become astronaut, the article concludes with prerequisites for becoming an astronaut.

2. ASTRONOMY THE NEXT GENERATION

By Ray Villard. *Astronomy*, v. 37, no. 11, November 2009, pp. 34-39.

Although it has always been hard to predict the future, astronomers are trying to establish the type of technology they will need to do groundbreaking research beyond the next decade. Villard takes a look at the current technological innovations in the field of astronomy and its future direction. It provides an in-depth overview of the upcoming Astro 2010—the Decadal Survey on Astronomy and Astrophysics. A committee of the National Research Council will conduct this survey in early 2010, which will facilitate ranking a list of astronomical missions for the next decade. It will also help Congress decide which new astronomical telescopes and space missions it will fund.

3. BUILDING NASA'S FUTURE

By Brittany Sauser. *Technology Review*, v. 112, no. 4, July/August 2009, pp. 80-83.

In this article, Sauser illustrates the development of the NASA's Ares I-X rocket. The Ares rockets are a crucial part of the Constellation program, NASA's plan for new manned flights to the moon and possibly to Mars and beyond. The Ares is designed to use separate launch vehicles to transport cargo and crew. While Ares I is scheduled to carry humans to space, Ares V will transport large-scale hardware such as items needed to establish a lunar base. Ares I-X is the first launch vehicle due for testing that will help design the Ares I and eliminate uncertainties when the first rocket flies off with humans onboard.

4. COSMIC VISION

By Timothy Ferris. *National Geographic*, v. 216, no. 1, July 2009, pp. 120-139.

Since Galileo's first telescopic observation of the night sky four hundred years ago, telescopic technology has come a long way. This article takes a look around the world exploring the contemporary technology and capacity of today's telescopes including that of the two-mirrored Large Binocular Telescope, which has capacity of delivering images ten times sharper than the Hubble Space Telescope. These giant telescopes of today provide astonishing views of the universe, such as Saturn's golden rings, star clusters glittering like jewelry on black velvet, and galaxies aglow with gentle starlight older than the human species.

5. FINDING OURSELVES

By Stephen J. Pyne. *Chronicle of Higher Education*, v. 55, no. 42, July 24, 2009, pp. B7-B9.

On the occasion of the 40th anniversary of the Apollo 11 lunar landing, Pyne looks back and evaluates the significance of the U.S. space program. According to the author, exploration is a cultural creation and some societies are disposed to it more than others. He categorizes the history of exploration into three coherent periods of discovery. Each phase had its preferred geographic realm, its characteristic technology, its motivating rivalries, its grand gestures, and its peculiar bond to a sustaining culture.

6. FROM THE MOON TO MARS

By Harrison H. Schmitt. *Scientific American*, v. 301, no. 1, July 2009, pp. 36-43.

Harrison H. Smith, the only scientist and field geologist ever to visit the moon, offers pointers for the scientists and astronauts who would one day visit Mars. Smith, who participated in the Apollo 17 moon mission, tells what should be kept in mind while examining that planet. He shares his experience of lunar exploration recalling how tricky it was to judge distance in the alien landscape, and how stiff spacesuit gloves limited his speed of working. He also talks about what scientists might expect on Mars and compares those with his experience of exploring the moon.

7. HOW WE'LL RETURN TO THE MOON

By James Oberg. *Astronomy*, v. 37, no. 8, August 2009, pp. 24-29.

After the Apollo program, the first wave of human exploration of the Moon, NASA is enthusiastic about its next lunar landing around 2020. Oberg explains the strategies and technical preparations for the next manned lunar landing, five decades after astronaut Gene Cernan lifted his foot back onto Apollo 17's lunar module on December 14, 1972 marking the end of first wave of human exploration of the Moon. He also notes the intended use of Ares I and Ares V launch vehicles. With NASA's potential robust systems for the next wave of human exploration, the Moon no longer will be a distant novelty but instead a home away from home.

8. INDIA'S QUEST FOR DUAL-USE TECHNOLOGY

By Matthew Hoey. *Bulletin of the Atomic Scientists*, v. 65, no. 5, September 2009, pp. 43-59.

Hoey scans through a decade of significant Indian efforts towards becoming a great power in space, missile, and nano technology. The author also talks about the heights in U.S.-India partnership and the way it has facilitated high-technology transfer between the two allies. The U.S. has significantly aided India in its pursuit of dual-use technology. The article takes a look at the concerns raised by some about technology-sharing between the two countries and explores if it qualifies as a harmless international engagement.

9. IS THIS THE BEST PLACE TO FIND LIFE IN THE SOLAR SYSTEM?

By Andrew Lawler. *Discover*, v. 30, no. 8, September 2009, pp. 42-47.

Human search of life in space has mostly been centered on Mars, the Red Planet. However, a dozen costly American missions have failed to provide any convincing clues of life on this planet. Looking beyond Mars, scientists are now increasingly pinning their hopes on Europa, one of Jupiter's moons with traces of water. NASA is planning to send a spacecraft in 2020 to Europa for probing beneath the surface of Europa's icy shell into the ocean that lies beneath. Most scientists believe that the nature of the ice will determine whether Europa really is a plausible home for alien life.

10. NAKED SINGULARITIES

By Pankaj S. Joshi. Scientific American, v. 300, no. 2, February 2009, pp. 36-43.

Contrary to the conventional wisdom that a large star eventually collapses to a black hole, the author explores the possibility of naked singularities—the infinitesimal point into which all the matter of the star gets crushed. The existence of a naked singularity may depend on factors like nature of a star's collapse and the relation between gravity and gas pressure. Touching upon one of the most important unresolved problems in astrophysics, the author discusses the potential of existence of naked singularities and raises question whether the conditions that support singularities could ever arise in nature.

11. NEW DAWN FOR ELECTRIC ROCKETS

By Edgar Y Choueiri. Scientific American, v. 300, no. 2, February 2009, pp. 58-65.

Looking beyond the conventional rockets that generate thrust by burning chemical fuel, Choueiri elaborates on the potential role of electric rockets in long-distance space missions. These new generation rockets propel space vehicles by applying electric or electromagnetic fields to clouds of charged particles, or plasmas. Despite electric rockets' lower thrust level, when compared to their chemical cousins, they offer greater speeds for the same amount of propellant. Because of their efficient use of propellant, the electric rockets offer great hopes for deep-space missions.

12. NEW HORIZONS MISSION DESIGN

By Yanping Guo and Robert W. Farquhar. Space Science Reviews, v. 140, August 2008, pp. 49-74.

Launched successfully on January 19, 2006, the New Horizons spacecraft flew by Jupiter on February 28, 2007, and is scheduled to encounter Pluto on July 14, 2015. Following its visit to Pluto, New Horizons will proceed to the Kuiper Belt objects. It took more than five years of efforts and initiatives to set the mission's objectives, requirements, and goals and to successfully launch New Horizon. This article gives a brief introduction before offering an in-depth discussion of various mission design requirements, the scope and objectives of the mission, various mission scenarios and opportunities, baseline mission design including its launch and interplanetary trajectory, and flight results.

13. OPEN SPACE

By Jon Excell. The Engineer, 13-26 July 2009, pp. 18-21.

This article explores what it takes to become a space tourist and the technological know-how behind it. Jon Excell reports that commercial space exploration technology could enable low-cost access to space in future for both tourists as well as scientist. Space tourism surfaced up in 2001 when multi-millionaire Dennis Tito paid 20 million U.S. dollars to Space Adventures, Ltd. to be sent to the International Space Station (ISS). Five other millionaires have followed in his footsteps including Richard Garriot, who spent 10 days aboard the ISS at a reported cost of 30 million U.S. dollars. Several companies are now working on the launcher and spaceship technology but based on current claims it looks as though Branson's Virgin Galactic is going to be the first of these so called 'new space' companies to take paying customers into the space.

14. SURRENDERING OUTER SPACE

By Alan W. Dowd. Policy Review, August/September 2009, pp. 55-66.

NASA has decided to retire its fleet of space shuttles including Discovery, Endeavour, and Atlantis by 2010 due to budget, age, and safety concerns. The decision of grounding the fleet has paved way for the Constellation program, which will introduce a more innovative generation of space flight vehicles including the Orion Crew Exploration Vehicle (CEV) and Ares I and V rockets. However, these next-generation vehicles will not be available until 2015 leaving a significant gap between the last shuttle flight and first CEV flight.

15. TAKE OFF WITH NASA'S KEPLER MISSION!

By David Koch, et al. The Science Teacher, v. 76, no. 1, pp. 42-46.

Kepler Mission, NASA's 10th Discovery mission, is an attempt to answer many questions about life in the universe. Kepler is a space-based specially designed 0.95 m aperture telescope, which is NASA's first mission capable of finding Earth-size and smaller planets in the habitable zone of other stars in our galaxy. Koch and other elaborate how this mission provides opportunity for interdisciplinary science teaching, as it combines Earth and space science with life science. The authors discuss some of the fundamental questions about planets and life that are associated with human search for habitable extrasolar planets.

16. BOOTING UP BAGHDAD

By Steven Levy. *Wired*, v. 17, no. 8, August 2009, pp. 102-107.

Nine executives from information technology companies traveled to Baghdad earlier this year hoping to spark some ideas on how a new wave of development and innovation might be kick-started in the war-ravaged economy. Executives from Google, MeetUp, Twitter, and YouTube were invited on the trip by the State Department in hopes that they might inspire breakthrough ideas. Levy's assessment of the delegation's impact is subdued at best—in meetings with the delegation. Iraqi officials seemed to have little grasp of self-starting ethic which has been key to the success of these companies in the Western world. Even talented Iraqi young people expressed a preference to find careers and security in government jobs, rather than pursuing an entrepreneurial idea of their own. But members of the delegation still came away with optimism about Iraq's future in information technology, and take pride in one of the few deliverables of their trip—Deputy Prime Minister Barham Salih is now on Twitter.

17. THE END OF PLENTY: THE GLOBAL FOOD CRISIS

By Joel K. Bourne Jr. *National Geographic*, v. 215, no. 6, June 2009. pp. 26-59.

<http://ngm.nationalgeographic.com/2009/06/cheap-food/bourne-text>

This special report reviews the problem of how to feed a world that is already consuming more food than farmers can produce. The combination of several factors has led to the current global food crisis. Populations in many poor countries are burgeoning, and consumers in countries experiencing new economic growth are eating more meat. There are growing demands for grain for food, animal feed and fuel. Global warming has restrained growth in yields by depleting water and soil resources. As a result, food prices have risen dramatically, and global grain reserves have dropped to record lows. These factors will likely ensure that food prices are not coming down soon. Although controversial, some are calling for another "green revolution", involving new seed varieties and environmentally-sound uses of fertilizer, pesticides and irrigation.

18. FORGING A SECOND AMERICAN CENTURY

By John Engler. *Forbes*, May 28, 2009.

<http://www.forbes.com/2009/05/27/john-engler-manufacturing-business-america.html>

In this series of stories called "Made in America," Engler, former three-term Michigan governor and current president of the National Association of Manufacturers, argues that American manufacturing will survive. He notes that the United States remains the world's largest manufacturing nation and accounts for more than 19.5 percent of global manufacturing output. Although 1.5 million manufacturing jobs have been lost, more than 12 million remain and manufacturing represent 11.6 percent of the U.S. gross domestic product. The bad news is that higher taxes, energy and regulatory costs place U.S. manufacturers at a disadvantage compared to their foreign competitors. The good news is that competition hones better manufacturing processes, and, as manufacturing become more automated, lower labor costs in places like China and India would become less important in the competitive picture.

19. IT'S OFFICIAL--THE ERA OF CHEAP OIL IS OVER

By Michael T. Klare. *The Nation*, posted June 11, 2009.

<http://www.thenation.com/doc/20090629/klare>

In its 2009 International Energy Outlook, the U.S. Department of Energy's Energy Information Administration (EIA) predicts a sharp drop in future global oil production. Klare notes that the EIA, which in past years has scoffed at the notion of impending global petroleum shortages, is now finally coming around to the conclusion that many experts have been warning about for years—that the era of cheap and plentiful oil is drawing to a close. While the EIA predicts that production of unconventional fuels will increase to fill the shortfall, Klare and others are doubtful that they will bridge the gap, given the large investment requirements and the tremendous adverse environmental impact. The EIA's report also highlights the insatiable demand for energy in Asia, and the fact that China will before long overtake the U.S. as the world's largest energy consumer, at which point it will be in a position to influence global energy policy and markets.

20. MINILATERALISM

By Moisés Naím. *Foreign Policy*, no. 173, July/August 2009, pp. 136-135.

<http://www.foreignpolicy.com/articles/2009/06/18/minilateralism>

Not only is globalization falling out of favor in many countries but multilateralism is also going through a crisis, says the author,

editor-in-chief of the magazine. The need for effective multicountry collaboration on issues like climate change, nuclear proliferation and pandemics has soared, but related multilateral talks have failed or execution of agreed solutions has stalled. Naím proposes what he views as a smarter, more targeted approach bringing to the table the smallest possible number of countries needed to have the largest possible impact on solving a particular problem. The magic number will vary greatly depending on the problem, but the author suggests that between a dozen and 20 countries should be able to effectively handle all important global problems. Countries not invited to such "minilateral" talks will denounce this approach as undemocratic and exclusionary, but Naím notes that agreements reached in smaller groups can provide the foundation on which more inclusive deals can be subsequently built.

21. THE WRONG MAN AT THE WRONG TIME

By William E. Leuchtenburg. American Heritage, v. 59, no. 2, Summer 2009, pp. 26-31, 72.

Leuchtenburg notes that for all his previous successes, President Herbert Hoover failed at arresting the economic free fall of the depression, or soothing the fears of a distressed nation. In 1932, Franklin Roosevelt defeated Hoover by a large majority by promising to get the economy back on track. As with President Obama in 2009, a number of Hoover's predecessors had confronted financial crises, but none had left him a usable legacy upon which to build. A former secretary of commerce, Hoover moved quickly to arrest the decline, summoning business leaders and government officials for meetings in November 1932. Hoover implored manufacturers to maintain wage rates and step up projects, asked unions not to strike and to withdraw demands for wage increases, and coaxed the Federal Reserve into expanding the money supply. Initially, his efforts were successful, however as the depression deepened and unemployment rose, the federal government provided little funding for relief. The author writes that Hoover "had no sense of how to reach out to a desperate nation." Among other things, he advocated tax increases along with cuts in government spending, the wrong solution for an ailing economy. Perhaps no single action cemented Hoover's reputation of heartlessness than his order for the army to disperse members of the "Bonus Army" of World War I, veterans and their families who gathered in Washington in spring 1932 to lobby Congress to redeem bonuses for their wartime services.

INTERNATIONAL POLITICAL RELATIONS & SECURITY

22. THE DEFAULT POWER: THE FALSE PROPHECY OF AMERICA'S DECLINE

By Josef Joffe. *Foreign Affairs*, v. 88, no. 5, September/October 2009, pp. 21-35.

According to Joffe, predicting the demise of U.S. global dominance has been an intellectual sport for 50 years. Yet he argues that no other country comes close to the United States' economic or military heft. Joffe doubts that China will eclipse the United States as a world power any time soon. "Alas, global standing is not measured by the low prices of nontradable goods, such as haircuts, bootlegged software, and government services," he says. Export dependence hurts China both by risky reliance on foreign customers and risky denial of domestic welfare. Even if China avoids internal upheaval, Joffe says, it faces the problem of a rapidly aging population. He doubts that even Europe will eclipse the United States—Europe lacks the will to use armed force as required by a global power. And the United States, alone among contending powers, shows the enlightened self-interest that breeds foreign influence, he says.

23. THE MAKING OF AN IRAN POLICY

By Roger Cohen. *New York Times Magazine*; August 2, 2009, pp. 36-43.

A *New York Times* columnist discusses the Obama administration's struggle with what he considers its biggest diplomatic challenge: Iran. The Bush administration's ideologically driven "axis-of-evil" approach to Iran had failed. Tehran continued to prosper by expanding its regional influence and was accelerating its nuclear program. The Obama administration believed it was time to seek normalization through a new approach. Secretary of State Hillary Clinton, whose instincts on Iran have always been more hawkish than the president's, was pushing for a harder line, supported by Vice President Joe Biden. However, they did not prevail. The Obama administration's conviction is that Ahmadinejad's election was fraudulent, but in the American interest and it is ready to overlook that and to talk. The White House had been deliberately impartial on the election outcome by directing its diplomatic overture chiefly at Ayatollah Ali Khamenei, Iran's supreme leader. In early May, Obama sent Khamenei a secret personal letter that proposed a framework for talks on the nuclear issue and regional security. The two things it had not planned for, however, were a situation of near-insurrection and Khamenei's shift into explicit alignment with Ahmadinejad.

DEMOCRACY & HUMAN RIGHTS

24. HUMAN RIGHTS IN CENTRAL EURASIA

By Martin C. Spechler. *Problems of Post-Communism*, v. 56, no. 2, March/April 2009, pp. 3-16.

Spechler examines the human-rights records of Central Eurasian states and finds Kyrgyzstan has the best democratic and rights record in the region. Kyrgyzstan is also rated best for economic freedom, and the author draws a correlation between political democracy/civil liberties and economic freedoms. In his attempt to establish a benchmark and evaluate the observance of human rights in the region, he also refers to the Universal Declaration of Human Rights, adopted in 1948 by the United Nations, in which all the Central Eurasian countries are full members.

25. LONG TIME COMING: PROSPECTS FOR DEMOCRACY IN IRAQ

By Bruce E. Moon. *International Security*, v. 33, no. 4, Spring 2009, pp. 115-148.

Prospects for democracy in Iraq should be assessed in light of the historical precedents of nations with comparable political experiences. Saddam Hussein's Iraq was an extreme autocracy, which lasted a long time. Since the end of the nineteenth century, only thirty nations have experienced an autocracy like Iraq's for a period exceeding two decades. The subsequent political experience of those nations offers a pessimistic forecast for Iraq and similar nations. Only seven of the thirty are now democratic, and only two of them have become established democracies, the democratic experiments in the other five are still in progress. Among the seven, the average time required to transit the path from extreme autocracy to viable, if precarious, democracy has been fifty years, and only two have managed this transition in fewer than twenty-five years. Even this sober assessment is probably too optimistic, because Iraq lacks the structural conditions that have been necessary for successful democratic transitions in the past. Thus, the odds of Iraq achieving democracy in the next quarter century are close to zero, at best about two in thirty, but likely far less.

26. AND DATA FOR ALL

By Nicholas Thompson. *Wired*, v. 17, no. 7, July 2009, pp. 68-71.

Barack Obama is the first president to appoint a chief information officer for the federal government. Vivek Kundra, who comes to the office having served in a similar position for the District of Columbia, conceived data.gov, a website where all government-produced information will be easy to find, sort and download. When that is done, according to Kundra, the private sector will find ways to use the data which will create new services for the public and new sources of profit for entrepreneurs. He points to the example of the Global Positioning System, which was once the exclusive property of the Department of Defense, is now used for a variety of commercial and public service purposes. "The key is recognizing that we don't have a monopoly on good ideas," Kundra told Thompson in an interview. "And that the federal government doesn't have infinite resources."

27. HEALTH INFORMATION ON THE INTERNET: SEEKING THE GOLD STANDARD

By Charles L. Brown, Belinda Yff and Charles S. Brown. *Choice*, v. 46, no. 12, August 2009, pp. 2239-2249.

The "gold standard" refers to an assessment algorithm used to identify high-quality health-related sites. In medical lingo, it is also known as a criterion standard, a benchmark, of the best comparison tool currently available. Interest in health-related websites has existed since the beginning of the Internet, and they continue to escalate in the present economic climate, as more Americans experience loss of jobs and medical insurance and turn to online resources for health information. This bibliographical essay describes various health websites, beginning with the substantial amount of material available from the U.S. government, including the National Institutes of Health, the National Library of Medicine, the World Health Organization, the Pan American Health Organization, the American Medical Association, websites for medical, allied health and nursing students, and electronic resources and e-books for students and professionals. The most popular commercial consumer health site is WebMD, which provides authoritative, multidimensional health information services.

28. THE LIMITS OF CONTROL

By Pamela J. Podger. *American Journalism Review*, August/September 2009, pp. 32-37.

For journalists today, social networking sites are increasingly blurring the line between the personal and professional. This creates a host of ethics and etiquette questions for news organizations, which are crafting guidelines for the growing number of staffers using social networks. Generally speaking, the advice to journalists is to identify themselves as journalists, tell recipients they are using social networks in a professional capacity, and remain mindful that people will regard them as representatives of their news organizations. Amy Webb, principal consultant at Webbmedia Group in Baltimore, says news organizations should be pondering the privacy and safety issues of a new crop of tools, including location-aware services. "When a *New York Times* reporter logs on to Facebook from his mobile phone, he's sharing a lot more information than his status updates. He's sharing the content he wrote and his location," Webb says. "There are safety and privacy issues around this."

GLOBAL ISSUES

29. THE BIG HEAT

By Corey Powell. *Discover*, v. 30, no. 6, June 2009, pp. 38-43.

Global warming is at once the most alarming challenge and the most controversial. Despite the potential for catastrophic environmental outcomes, a large segment of the U.S. public still doubts that climate change will cause major harm or that it is occurring at all. *Discover Magazine* editor-in-chief Powell moderates a discussion between four prominent climate scientists, who discuss the evidence that climate change is occurring. For them, the different events occurring simultaneously are hard not to pin on global warming, such as the loss of ice mass in both polar regions, the increasing acidification of the oceans, and the potential for widespread crop failures in many equatorial regions where crops are already being raised at temperatures close to their photosynthetic limits. They fear that it may be too late to make the needed changes if humanity waits until there is international cooperation. Powell calls for leadership by the U.S. and Europe.

30. WIND POWER'S WEIRD EFFECT

By Jonathan Fahey. *Forbes*, September 7, 2009.

<http://www.forbes.com/forbes/2009/0907/outfront-energy-exelon-wind-powers-weird-effect.html>

In this article the author explores the mixed reports about wind power. The good news is that wind energy offers cheap energy. In some parts of the United States when there is too much power on the grid, wholesale power prices are now dropping to zero or below at certain times of the day. The bad news is that wind turbines spin the most at night when demand is low and the least during afternoons when more power is needed. Some power plants are hard pressed to power down when wind power is at its highest. In the long run, the wind power boom could push daytime prices higher. To balance out fickle wind turbines, utilities will need electricity during peak times from gas-fired plants, that intermittent power will be expensive.

U.S. SOCIETY, VALUES & POLITICS

31. AMERICAN LITERARY BIOGRAPHY: HISTORY OF THE GENRE

By Carl Rollyson. *Choice*, v. 46, no. 11, July 2009, pp. 2059-2067.

The author, a biographer and professor of journalism, notes that literary biography came of age in America after the Second World War. Although biographies of American writers appeared before 1950, most of them tended to be scholarly studies aimed at presenting the facts of a literary figure's life and the sources writers used to create their prose and their poetry. Rollyson surveys the literature by decade beginning in the Edel/Ellmann Age with Leon Edel's much-discussed book *Henry James: The Untried Years, 1843-1870*, and Richard Ellmann's well-received biography of James Joyce, both considered the first masterpieces of the genre. The author then heads his discussion into the 1960s and the decades that followed, including the new millennium. He evaluates over ninety works, including six biographies of poet Sylvia Plath. As much as some literary critics want to diminish the importance of American literary biography, in fact the genre has grown in importance, highlighting many different kinds of writers, including many academics who a generation ago would most likely not have considered this field of study.

32. HOW DAVID BEATS GOLIATH: WHEN UNDERDOGS BREAK THE RULES

By Malcolm Gladwell. *New Yorker*, v. 85, no. 13, May 11, 2009, pp. 40-49.

http://www.newyorker.com/reporting/2009/05/11/090511fa_fact_gladwell

Drawing on examples that include a girl's middle school basketball team, Bedouin insurgents led by T.E. Lawrence in Arabia, and David vs. Goliath, Gladwell shows how using a "full-court press" strategy can succeed against opponents of greater power and ability. Attitude, innovation and the will to operate outside the establishment are keys. "We tell ourselves skill is the precious resource and effort is the commodity ... it's the other way around," he writes.

33. OUT OF THE KITCHEN, ONTO THE COUCH

By Michael Pollan. *New York Times Magazine*; August 2, 2009, pp. 26-35, 44, 46-47.

The author notes that the increasing popularity of cooking shows on television has coincided with a decrease in home cooking. The rise of cooking celebrities such as Julia Child, Alice Waters or Martha Stewart has been paralleled by the rise of fast food and home-meal replacements. The decline of home cooking has several causes-women working outside the home, food companies persuading Americans to let them do the cooking, and advances in technology that made it easier for them to do so. Cooking is no longer obligatory and for many people that has been a blessing. Ironically, the year Julia Child went on the air, 1963, was the same year Betty Friedan published *The Feminine Mystique*, the book that taught millions of American women to regard housework and cooking as drudgery. The author notes that Julia Child never referred to her viewers as "housewives" and never condescended to them. Rather, she tried to show that cooking, approached in the proper spirit, offered fulfillment and deserved attention.

34. VALUE PROPOSITION

By J. Donald Monan. *Boston College Magazine*, v. 69, no. 3, Summer 2009, pp. 24-27.

http://bcm.bc.edu/issues/summer_2009/features/value-proposition.html

The author, former president of Boston College, addressed a group of higher education leaders at a Boston hotel on the purpose of a liberal arts education. Monan notes that liberal education has been weakened by a variety of factors, including the pressures for specialized skills in a mobilized society and, within the undergraduate college itself, the increasing specialization, departmentalization, and consequent isolation of faculty members and their offerings. Instead, American higher education should be directed almost exclusively at

the intellects of students through the communication of truths, skills, habits and qualities of intellect. Liberal education should aspire, at its deepest level of intention, to educate for the enriching and constructive exercise of liberty.

SCIENCE & TECHNOLOGY

35. THE BRAIN

By Carl Zimmer. *Discover*, v. 30, no. 7, July/August 2009, pp. 24-25.

With billions of brain neurons, humans have difficulty staying focused. Mind wandering does not necessarily mean boredom, rather, it is normal. Although we make mistakes when our minds wander, it may also be beneficial. Studies show a profound mind wandering, or "zoning out," when the person is completely unaware they have lost focus, may be "the most fruitful type." Mind wandering may invite creative flashes of inspiration. Our brains maintain a delicate balance between near-term and long-term thinking, while monitoring our awareness.

36. GONE IN 90 SECONDS

By Michael Brooks. *New Scientist*, v. 201, no. 2700, March 21, 2009, pp. 31-35.

<http://www.newscientist.com/article/mg20127001.300-space-storm-alert-90-seconds-from-catastrophe.html?full=true>

A recent report by NASA and the U.S. National Academy of Sciences warns that plasma storms from the sun—commonly seen in northern latitudes as auroras—pose a serious danger to electric power grids. A plasma incursion from a severe space weather event would cause rapid changes in the Earth's magnetic field, and would induce massive direct currents in long-distance high-voltage power lines, causing transformers to melt from the overload. The author notes that such an event took place in 1859, and caused severe disruptions in the telegraph networks. Today, industrial civilization has unwittingly "sown the seeds of their own destruction," as modern systems are completely dependent on electric power for food delivery, heating, cooling and refrigeration, water, sewage disposal and pharmaceuticals. A serious plasma storm could knock out hundreds of transformers within seconds, putting millions of lives at risk, and such an event would take months to recover from. The author notes that the U.S. is not alone in facing this risk—Europe is vulnerable, and China is building a 1000-kilovolt electric grid, twice that of the U.S. grid.

37. NANOMEDICINE TARGETS CANCER

By James R. Heath, Mark E. Davis and Leroy Hood. Scientific American, v. 300, no. 2, January 2009, pp. 44-51.

Nanoscale technologies—those at the scale of molecules and atoms—can transform how disease is understood, attacked and possibly prevented. A "systems" approach to medicine views the body as a complex network of molecular interactions that can be measured and modeled, revealing causes of disease such as cancer. Extremely miniaturized tools can inexpensively measure and manipulate molecules for systems medicine. Nanoscale therapies deliver precisely targeted treatments to tumors while avoiding healthy tissues.

38. THE POST-TRAUMATIC STRESS TRAP

By David Dobbs. Scientific American, v. 300, no. 4, April 2009, pp. 64-69.

A growing number of experts insist that the concept of post-traumatic stress disorder (PTSD) is itself disordered and that soldiers are suffering as a result. The PTSD syndrome is under fire because its defining criteria are too broad, leading to rampant overdiagnosis. The flawed PTSD concept may mistake soldiers' natural process of adjustment to civilian life for dysfunction. Misdiagnosed soldiers receive the wrong treatments and risk becoming mired in a Veterans Administration system that encourages chronic disability.

39. VACCINATION NATION

By Chris Mooney. Discover; v. 30, no. 6, June 2009, pp. 58-65, 75.

Several recent court rulings finding that vaccines do not cause autism have done little to quiet the angry debate that began a decade ago. The anti-vaccine story has spread rapidly in the mass media and on the Internet, drawing many celebrity supporters. While there is still uncertainty on whether the reported increase in autism is merely due to increased attention to the condition or a range of environmental triggers, the vaccine-autism connection has been refuted by scientific research. The author notes that the scientific and medical community was slow to respond to the growing public reaction against vaccines, noting that "it's not hard to scare people, but it's extremely difficult to unscare them." The greater threat, notes the author, is holding back vaccines. The great success of vaccines in eradicating diseases is a reason why the antivaccination sentiment has thrived; few people today remember the devastation caused by these scourges. The major challenge today, Mooney notes, is to maintain public support for vaccination programs and to "explore how science and so many citizens fell out of touch."

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