

| General Comments | Industry power, manufacturing processes, resources, transportation | Military | Biotech Medicine, cybertech, engineering, biomods | Infotech Communications, computers, data analysis, memetics | Space |
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| 2000 | WW Energy Consumption: 400 trillion MJ US Energy Consumption: 120 trillion MJ As WW industrializes, total consumption will begin to look more like 500 trillion MJ per billion POP. | Cermet armor proposed for tanks. | | Operating systems still painful to use. | |
| 2001 | Shift to contract manufacturing and specialized, local factories over next decade. Robot arms in factories are programmed using Teach Box method (operator moves them through motions, which they then flawlessly repeat). | | Rough draft of the human genome complete. "Threat" of cloning. | First simplistic biocomputer, constructed with leech neurons. First simplistic quantum computer, capable of 7-bit manipulation. Google offers ubiquitous web translation services; while translation existed prior to this, it saw use only rarely. | International space station usable for small scientific teams. |
| 2002 | Australia: Solar power electricity is cheaper than fossil fuel electricity. Robot arm in US learns to apply a specific amount of force (rather than simply move a particular distance) and adapt to slightly changed conditions and materials. | | Genetic testing of eggs/sperm allows "screening" for one or two well known genetic flaws. Over the next decade, many, many such flaws will be identified. Geneengineered pig's heart is usable for human heart transplant. Virtual operating theatres become common for use with microsurgery. Neurochip implant in human optic nerve manages 8x8 resolution Neurochip interfaces with monkey to give "thought control" over mouse cursor with very little training (uses "coordinating neurons" in motor control center). | US Patent system abuses continue, and continue to raise questions about the nature of intellectual property. Internet POP 500 million. The majority are English speaking, but almost a third are Chinese speaking. DNA computer solves the Travelling Salesman problem. Unfortunately, not easily replicable, and the computer must be custom built for each highly specific question. | Hubble repaired and renovated. |
| 2003 | Home circuit printing becomes available; a typical printer costs a few tens of thousands of dollars, and can produce very simple processors (operating at a few kilohertz). | | Gene therapy for several related eye diseases (gene therapy work on adults for many things). Biochip applications begin to leave the laboratory, such testing blood samples for a known DNA flaw, "sniffing" for a particular chemical in the air, and so on. Most biochips are detection oriented. | Wireless networks common. Internet POP 1 billion people; the majority are now Chinese, with English a close second. English is still the language of technology. Vivissimo search engine begins to climb in popularity. | |
| 2004 | Glassteel, a transparent ceramic with similar compressive and tensile strength to aluminum (despite the name). | Extremely bullet proof windows & faceplates (glassteel). | Laser surgery can do cell-by-cell cutting, and largely replaces conventional invasive surgery for many applications. Cancer, in particular, can be rooted out in an intensive, expensive, but effective session of cancerous cell elimination. Micro-robotic surgery (combined with a virtual surgical theatre) can repair arteries and similar small organs on the fly, without invasive cutting. Biochips find use as drug sniffers in some early adopter police districts. | Ubiquitous wireless protocols first become available. By ubiquitous, I mean that they are in common use, to the point that people no longer really notice their presence. Patent system begins to collapse under the weight of abuses. Internet POP 2 billion people, and rising fast. Pundits predict that everyone on the planet will have some sort of Internet access by the end of the next two years. Internet language translation software improves dramatically; most offer English-Chinese at a minimum. | |
| 2005 | Nanomanufacturing (building molecule-sized mechanical objects) becomes possible, but a small, low-output factory is estimated to cost \$25 billion dollars. This kind of nanofac is essentially a permanent emplacement of micron-sized arms which assemble atoms with fair precision. It is not self-replicating, and is costly to assemble, but allows the construction of novel substances, quantum computers, and self-assembling nano structures. | | Neurochip in the optic nerv manages 25x25 resolution, sufficient for very slow reading among the blind. Still too expensive for the gain, however. | Quantum computer can do light calculus. Project 911: all handheld, wireless communication devices (cell phones) must have GPS capabilities built in, so they can be tracked to a location by emergency personnel. Open Source scaling problems become a major issue. Begins to less resemble a community, and more like a large number of communities using a similar methodology. | International space station complete. |
| 2006 | | Several new soldier-level technologies come into use for the first time: fully automatic 20mm grenade launchers, self-propelled HEAT rounds, mobile walker gun platforms and combat pickup trucks. | First telomerase experiments on humans (longevity treatments). | E-ink books & newspapers begin to gain acceptance. Wireless, wearable computers start to come into vogue; sunglasses (bulky) are the primary interface. Equivalent to early cell phones in popularity. Internet POP 5 billion, and growth is slowing. Virtually everyone is online in some form or fashion, but more than a billion have held off. Chinese is the largest group, followed closely by English and Spanish. | NASA puts microbots on the moon, as a reference mission for a later "bots on Mars" mission. |
| 2007 | "Aerogel concrete" invented; costs about \$1 million per cubic centimeter to make, however. | Military-grade lasers; robust, powerful, man portable. Paralysis masers. | EU: First human clone brought to term, already illegal. | Echip proposed to replace SSN for national identification in the US. Mostly backed by corporations, it is hideously privacy-invasive, and is largely killed by the popular opinion... although most agree that SOME form of new ID system is needed. Patentgate (the US Patent Office has been criminally lax in granting patents) opens up a slew of debate; ultimately, the current system is overhauled for efficiency, but not scrapped as many info-advocates recommend. | |
| 2008 | IBM begins construction of a nanofactory, to be completed in 2012; it will be used for research into nanomachines. | US develops practical Anti-Missile systems; they do a reasonably good job, although this mainly means that losses to enemy missiles is similar to losses to enemy bullets, rather than hideous more. The first soldierbugs (military application microbots) begin stalking the field. Although not as effective as promised, they are still terrible weapons and information gathering tools. | German medical researchers demonstrate first true optical neurochip "vision"; a videocamera sends signals to the neurochip which translates the data into electrical pulses into the optic cord. A blind person sees in extremely low-res for the first time in year | Webnet (new broadband wireless standard) replaces current wireless protocols. Webnet is a catch phrase for the major protocol which will become the Internet of the future. Webnet includes protocols for language recognition (built into files on Webnet) which allows client-end translation software to become an invisible part of the interface. Many of these are poor, but they allow cross-pollination of ideas regardless of language. Gesture & attention recognition can commercially feasible; requires several camera angles, and is currently only useful in a room setting. The Patent Office goes through a massive redistribution program with a great deal of modern search & data analysis technology included. | China begins a manned space program; focuses on "miletstones" (humans in space, human on the moon) to test the waters. |

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| 2009 | Various manufacturers worldwide begin to use fully webnet-enabled factories, increasing efficiency by a factor of about two. Circuit printers becomes affordable (\$2000 or so) and capable of producing fairly complex, low-speed processors (4+ MHz). US Energy Consumption: 200 trillion MJ. | Cyberbomb developed in the Middle East. Used to deny US access to soldierbugs, but also nearly tears down the national infrastructure. | Genefixing (screening sperm & eggs for flaws and only allowing a viable pair to combine, then replanting in the uterus) becomes somewhat common; "unflawed" children begin to represent a small sample of humanity. | Perfect computer voice dictation; no language parsing still. This is not the gradual improvement of the old software, but a whole new methodology (stimulation of neurons; built around the biocomputer from 2001). Note that language translation (albeit often poor) is different from parsing. The cyberbomb: a fast-moving worm which abuses Webnet protocols to bring down Webnet hubs. | |
| 2010 | GenIII nuclear powerplants are fairly common in isolated areas. WW Energy Consumption: 1.5 quadrillion MJ US Energy Consumption: 180 trillion MJ | | Chinese government begins funding research into neurchips and biochips. Optical neurochip surgery costs about \$30,000 per eye, but allows megapixel, 10Hz vision. Cryogenic suspension tech peaks; minimal ice damage now occurs. | Webnet 2.0 achieves wireless anywhere and protection against "cyberbombs". Webnet 2.0 is organized heavily by nation, with individual nations able to collectively "block" other nations. US, Russia, European Union and many, many smaller countries enter a Global Intellectual Property agreement. China is invited, but refuses to sign. An international Patent Organization is formed, modelled on the present US Patent Office; it is almost entirely Webnet enabled, but requires "member nation" status to access. | |
| 2011 | IBM completes the world's first manufacturing facility; the first thing publicized "object" built is the world's smallest spring-powered watch. | | Cloning technology opens the door to specialized tissue growth. Complete heart repair (and other forms of tissue replacement) becomes possible for the very wealthy. With very expensive surgery, some cryogenic ice damage could even be repaired. | Internet POP is now believed to equal world POP, with the exception of Middle East stragglers. Roughly a quarter of that is wireless. A 200-neuron biocomputer is successfully taught simplistic speech; it operates a robot which it can move around in response to commands, and commands can be "fuzzy" and inobvious. PatentNet has major offices in New York City, Berlin and Moscow. Patents follow a tree-like structure, with automated data spiders constantly linking similar-looking processes and bringing them to human attention for analysis. There is talk of making a universal "KnowledgeNet" which would also include copyright and special case intellectual property, but no movement has been made on it. | |
| 2012 | Transparent circuitry. Circuit printing reaches 33 MHz processors & motherboards; the Open Source Hardware movement begins to get into full swing. Dextrous robot arms become possible in a factory setting; still not as accurate as a human, but good enough for some applications. | | Customizable retrovirii possible; human genes can be edited on a known. | GID (Global Identifier) protocol proposed and accepted. Roughly 75% of the Internet POP is wireless. Gennemans System of weather analysis includes a large number of suspected global trends, industrial production data, climactic cycles (including Ice Ages) and Earth's cyclical shifting off the solar plane; accuracy rises measurably, although many of the assumptions are flawed. | Cost to reach LEO: \$2,000 per kg, using the X-43 system. |
| 2013 | Reduction in costs leads to several more nanofactories being planned for construction. | | A tendency for heart disease that will kill you at 30 can now be spotted as early as age 18. | Webnet 3.0 formal proposal. | |
| 2014 | Factory automation reaches all-time high. The first "full featured computer" is printed on a circuit printer. It is roughly equivalent to a Pentium II from 1998, but is about the size of a Palm Pilot. First "Vision21" powerplants go online. Operating at high (50%+) efficiencies with no emissions, they slowly begin replacing more polluting powerplants. | Powered armor is developed in the US; much of the technology is sold to dedicated allies (Russia and China). | The first "genefixed" and "retrovirus repaired" child is born. | Non-wireless Internet access has become rare. Singularity Institute makes formal "friendly AI" theory proposal. | First space-based interferometer telescope is put into orbit. Tweaks are necessary to get it working, but by the end of the year a simulated telescope with a diameter equivalent to the diameter of High Earth Orbit is functioning smoothly. |
| 2015 | Self-replicating nanomachines turns out to be as difficult as self-replicating macromachines, and about as functional. Diamondoid coating becomes possible, but hideously expensive for little real effect. Nanotubes can be produced at any length, but are equally expensive. "Climate Architecture" becomes popular in new houses, and some retrofitting occurs with older houses. Climate Architecture uses passive solar heating, phase change materials (which absorb and release heat to maintain a constant temp) and carefully engineered ventilation to regulate temperature, slicing climate control energy costs to roughly 1/5th normal. Over the next five years, they will also begin to include solar panels which cover the remaining energy costs, turning solar heating into solar cooling. | | Russian-based nanofac Monocyte Inc begins first production run of optical neurochips for \$5,000 per eye. Begins looking into R&D for the other senses. | PDA is 0.5 GHz. Marcia Rodriguez comes into the public eye for her market prediction skills (and growing wealth). Marcia is using a proprietary, secret analysis system. Over the next five years, there will be a boom of people attempting to mimic it. | Astronomy: Earth-mass planets with low eccentricity orbits can now be spotted around stars; six are spotted in the first year. |
| 2016 | IBM shifts to researching nanofacs, tiny general-purpose manufacturing lines that can produce chips and MEMs with atomic precision. Most US cars are hybrid or fuel-cell. Vision21 powerplants become common, replacing coal plants and supplementing solar, hydro and air power. WW Energy Consumption: 2.2 quadrillion MJ US Energy Consumption: 160 trillion MJ (domestic has dropped, military has risen) | Russia builds a "laserwing"; a small wing/body aircraft with a single, high-power laser which it uses to punch targets remotely. | The Bright Hope supercomputer completes a generic guide to the human genome; the first real possibility of trait selection in babies becomes evident. Work begins to allow drugs to be tailored to the genetic/protein makeup of the subject; work in this field will roughly double the total number of drugs in five years. | Desktop computer 1 THz. | |
| 2017 | Ghost farms begin to crop up as rural families abandon their homes for urban jobs and money. | Xerox PARC completes their first nanofactory, and begins playing God with small molecules. | Cloning technology becomes cheaper, thanks to derivative technology from nanofactory research. However, only highly-specialized tissues benefit from the cost breaks. The cochlear-hair cells in the ear (damage to these is the most common cause of hearing loss as we age) can be regenerated at a \$8,000 session. | Quantum computer solves the Wandering Salesman problem. | An Earth-mass planet is detected around Delta Pavonis (19.9 ly) which appears to be in a stable orbit within the "life band" for liquid water (1.1 AU). Delta Pavonis is extremely similar to Sol, but about 1.2 times brighter and a bit older. |

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| 2018 | Solar power begins rapid rise in popularity. Climate Architecture in particular, begins to see use of solar power. Local zoning laws become more lax about solar panels. GenIV nuclear powerplants (fission, produce ~25 kW/kg) begin to see fast progress in US and Russia (in development since 1995). | | Retrovirus "DNA repair" reduces age effects by 20%, with diminishing returns. The potential dangers of using it keep it in testing limbo for many, many years. Chinese corp Mai Bo successfully rebuilds organs using cloned tissue (heart, inner ear). | Most human literature (for any language) can be found on Webnet now. | An Earth-mass moon is detected around Beta Comae Berenices (29.9 ly) which appears to be orbiting a Jupiter-class planet in a stable orbit within the "life band" for liquid water (1.2 AU). Beta Comae Berenices is fairly similar to Sol, but about 1.4 times brighter and considerably older. |
| 2019 | Robot automation becomes plausible. Robots can now "see" and "feel" what they are doing, with sophisticated sensors and sensor analysis hardware. Programming with a high level language is now possible. | | Genotyping (a map of DNA, with "critical pairs" filed into a database) developed. Allows highly customized medical drugs to be applied without fear. | Webnet 3.0 comes online, offers insane amounts of bandwidth. | Over the next decade, ten more Earth-mass planets are found in stable orbits within the "life band" of stars; however, none are as tantalizingly close as Delta Pavonis or Beta Comae Berenices (most are, in fact, 60 ly or more distant). |
| 2020 | General: Air is cleaner in 1st world countries, dirtier in 2nd world countries, horrendous in Middle East and Africa. | | The firstborn of the decade is also the first genfixed and trait selected baby; essentially, an artificial baby built with bits of its parents genes. Cryo Inc develops the ability to use genotyping information to create a roadmap for gross physical repairs of a frozen body. | Commercial, advanced learning expert systems (specialized, limited AI). | |
| 2021 | Russian-Chinese Cold War cuts a line in the tech world, preventing some spillover of ideas. The Bamboo Curtain is bitterly resented by many scientists. | IBM overhauls their manufacturing facility, and sets up their first fully automated nanofac conveyor line. Flexible and general purpose, they can produce MEMs of almost any sort given the right materials and MolecuCAD instructions. | Roughly 1200 drugs are now available to the medical profession | The Marcia Algorithm for market prediction is released to the public. Knowledge of the method makes the market more complex, and causes the algorithm to fail from this point on. | |
| 2022 | Transparent MEM LED screens. Oil resources worldwide begin to peak; excepting the Middle East (which has seen a marked decline in oil use), roughly half of the world's oil reserve has been used; the remainder (again, excepting the Middle East) would sustain the economy for another 40 years without alternative energy. If the Middle East is accounted for, add another 30-50 years. | | Surgical lasers are used to fuse tooth enamel, hardening it against bacterial attack. Chinese scientists manage to replicate complex neural pathways, mostly by craft. The surgery is expensive, but damaged areas of the nervous system can now be replaced with cloned tissue (but only in China). Human controls mouse cursor with mind (see neurochips in 2004), with a 1mm square neurochip implant. | Language parsing biocomputer constructed, still somewhat simplistic speech. Speech parsing improves dramatically over the next two decades. This is the first biocomputer complex enough to achieve complete English language parsing, and is hailed as a triumph in both AI and hardware engineering fields. Webnet translation software improves dramatically over the next two decades. | China gets a human on the moon. Declares intent to put a human on Mars. |
| 2023 | Nanoblocks invented. These are small molecular bricks which can grip each other, slide across each other, and extend an arm to construct another nanoblock if the proper atomic soup is in the area. Nanoblocks are extremely useful for smart materials, but are difficult to program for, and are incapable of complex activities. However, it is still considered a landmark, since it is the first Bottom Up nanoscale manufacturing process in history. They are billed as "fluid solids". The first GenIV nuclear powerplants go live. GenIV plants offer exceptional safety, efficiency and reliability, with minimal waste | | Extremely expensive adaptive optics contact lenses available for purchase. Most people have their DNA on file with their doctor (with the "critical pairs" filed first). Drugs are tailored to this file, and transplants (if you are not rich enough for cloned tissue reconstruction) can be quickly tested and matched for you. | Webnet 3.2 modification proposed. Wearable computers use transparent LED screens; now equivalent to regular sunglasses. | US-Russian Alliance commits to a manned Mars mission, enter planning stages. NASA's microbots missions put on hold; hundreds of cheap missions are sacrificed for one very expensive potential mission. The goal is to leave for Mars by 2027, the best available alignment of planets. |
| 2024 | Over the next two decades, material processes and technologies gradually become cheaper and cheaper. Diamond layering becomes cheap enough to make as clothing. | | Roughly 3000 drugs are available to the medical profession; however, the rate of new drugs has slowed. | Webnet 3.2 updates world network seamlessly. Or mostly seamlessly; very few problems afflict the update. | China puts a small space lab in space as a first step to Mars. |
| 2025 | | | Cloned eye, retina, ocular nerve, etc., now possible for \$25,000 per eye. Optical neurochips + camera only cost about \$3,000 per eye, and are fairly high resolution now. Neurochip "motor controls" are becoming common in hospitals. | The first contact lens interface, using adaptive optics, transparent circuitry (including LED & short-range radio signal) is developed for use with wearable computers. Costs \$12,000 for a pair. MEM Gyro gloves are developed for use with wearable computers. | Artemis Project: first flight to the moon ("reference mission") put camera on the surface. This is far later than originally intended, but a variety of practical and political difficulties extended the time scale. |
| 2026 | A Russian corporation's R&D produces a version of "very large" nanoblocks which have limited program capabilities, and the ability to build variations of themselves, by imitating the infostructure of organic cells. Predictably, they're called cells. | | Telomerase treatments are publicly accepted (costly, +10% lifespan). "Brain maps" similar to genome maps become available. Combined with increasing knowledge about the brain's physiology, hi-rez brain scans can be used to identify common mental illnesses. Microlaser surgery can even reverse the progress of some of these. Progress flows unstopped by ethical questions. Combined with tissue cloning, brain maps can be used to repair most brain damage in a cryogenic patient. | Remote programming of "cell nanoblocks". | Several US companies come out with cheap launch procedures, primarily for satellites, but useful for anything up to several hundred kilograms. Cost to enter LEO: \$100 per kg, but does not scale much past 100 kg. |
| 2027 | | Nanofac robots are now programmable by verbal description. | Genfixing becomes ubiquitous. Trait selection is commonly accepted. Influenza pandemic breaks out in Africa and Europe (east and west). Bits of it spill over into US and Russia, where a second pandemic occurs. This influenza is highly resistant to all medicines, and eventually runs its course. | GID protocol is resurrected, overhauled for privacy and "palatability" of the US public. Toby Hauther makes "enhanced reality" a practical reality with a new wearable OS. Total cost for a state-of-the-art wearable computer still hovers around \$10,000, however. | China's first "human on Mars" mission is a catastrophic failure. Investigation indicates that something hit the ship, possibly a micrometeorite... but China will continue to investigate the possibility of a missile. US-Russian Space Alliance misses their first target date. |
| 2028 | Robots: Autonomous movement, obstacle avoidance and path-finding. The first autonomous farm tractor is demonstrated in Kansas. Completely functional, it is also too expensive, at a cost of \$1 million. | | Mental illness is not viewed as a moral failure, but an organ failure (the brain). Brain scans begin to see some minor use in courts. | Palm Pilot is 100+ GHz, hearing-aid sized computer is 1 GHz. | China repairs their space lab, and prepares for next launch to Mars. |
| 2029 | GenIV nuclear powerplants begin to standardize energy production throughout US and Russia, and begin to see use in EU and a few allied countries. | | AIDS still can not be directly cured, but babies can be born with natural resistance to it. | A set of standardized protocols for Cells (cell-sized nanoblocks) comes into existence, creating a kind of packet-based network for any given glob of Cells. | China launches their second Mars Mission near the end of the year; nothing untoward happens to this one. It is expected to arrive in 9 months. US-Russian misses their second target date. Cost to reach LEO: \$200 per kg (scales up for NASA) using an extended flight system. |

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| 2030 | Programming volumetric shapes becomes considerably easier. Cells can form lattices and build objects within the lattice, slowly moving outward as they do so. | Fully autonomous spy planes. | Neurochip cursor control begins to see commercial use in conjunction with contact lens computer interfaces. Cost for the surgery is \$5,000, tacked onto any other cost for a wearable system. Research into using Cells to perform surgery begins. Primary obstacles are dynamic nature of the living environment and excess heat. | IDTT (Ident-tattoo) concept bandied about, uses further revised GID protocol. Quantum "distanceless" (instant) communication. Poor bandwidth (acceptable to military); requires massive physical installations. | US-Russian Space Alliance puts a small, manned launch station at the L4 Lagrange point, as the first stage to Mars. Mars is given an unusually high priority, even though it is now well known that China will win the race. China misses its first Mars orbit, and settles into a game of "chase-the-planet". |
| 2031 | Aerogel concrete pricing drops to \$10/cc almost overnight. Still too damned expensive for any kind of architecture. Robotics begin to replace humans in many areas of industrial production, from warehouse inventory management to custom car painting. Nanotubes can now be produced consistently and cheaply, at any length. | | Telomerase treatments ubiquitous (average lifespan +9 years). | Webnet 3.22 update becomes available, but is installed locally only; includes "local only" GID protocols for use with voluntary systems. Desktop computer is 1,000 THz. Supercomputer as complex as human brain possible. The neural structure of the human brain is only the macro part if intelligence. Sentience arises from the more complex behaviors of the quantum fields on the surface of the neurons, which determines in large part how they fire. Quantum self-referencing and bootstrap energy spikes are needed for that peculiar thing known as "self awareness". | China's Mars Mission enters a stable orbit around Mars and begins planning the details of the descent. Near the middle of the year, they land on Mars. The televised landing breaks all media records for attention. Plans for using cheap nanotubes to build a space elevator proposed. Cost would still be around \$25 billion. |
| 2032 | Ford opens the first Cell-based manufacturing plant. A trailer-sized room is filled with Cell goop. Cells, and the raw materials intended for the car. Careful programming of the Cell network allows them to slowly construct a lattice and then build the car, molecule by molecule, within it. As the car completes, the lattice pulls away, leaving the car dry and perfectly formed. The first car to be constructed is the Ford Highwayman, a high-performance sports car. Manufacturing cost was \$1,200 (although R&D involved was astronomical). | | Thought-controlled prosthetic arm available on the market. | "Lizard" complexity biocomputer possible, but too expensive to be feasible for most purposes. | US-Russian Space Alliance launches their Mars Mission. It is expected to arrive in 4 months, using a plasma rocket system. At the cusp of the new year, the US-Russian Mars Mission enters Mars orbit. |
| 2033 | Disney constructs the Fantasy Ice Tower, a 40 story, translucent roundtower (aerogel concrete) with a glass-shielded spiral escalator climbing the outside surface, and a Disney museum at the top. Total cost \$400 million. | | | The first full-featured AI, "Ada Turing" goes online. A.T. is not actually sentient, per se, but it is capable of applying surprisingly rational thinking to problems. | Artemis Project: expensive "tourism" flights to moon possible (cost is roughly your weight in kilograms x \$500). US-Russian Mars Mission lands on Mars 163 kilometers from the Chinese Mars Mission. The Chinese mission has suffered difficulties with liftoff, and the US-Russian craft dumps several hundred kilos of sensor equipment to take on the Chinese astronauts. |
| 2034 | Oil power is functionally obsolete except in Third World countries, and a few specialized areas (people who kept personal generators, for example, continue to do so). | | Retrovirus "DNA Repair" becomes publicly accepted, stepped over the course of a lifetime, it can increase lifespan by nearly 30%. | GID/IDTT protocol is revised, allows for "local" settings. SOTA wearable can cost as little as \$3,000. | US-Russian Mars Mission relaunches from the surface of Mars and returns to Earth in 125 days, US, Russian, and Chinese astronauts share Thanksgiving Day in space. |
| 2035 | GenV nuclear fission plant prototype constructed; however, it does not offer significant gains over GenIV plants. | | | Webnet 3.4 updates worldwide; allows local quantum communication "locally". Webnet 3.4 also has approved protocol for identatons. While quantum comm is allowed locally, the comm units themselves cost a few million dollars and are about the size of a small house. AI-driven weather system achieves 99.99% success rate for global weather at a resolution of 1 square mile; uses improved Genneman System (mostly improved assumptions) and AI monitoring and learning system. | Equatorial launch facility opens in the Galapagos Islands (of Ecuador). It includes two complete sets of landing and launching facilities, a mass driver the length of the island (for putting very small satellites into orbit), and a massive communications center. Getting to LEO costs about \$25 per kilogram for a small satellite or \$80 per kilogram for anything larger (and scales nicely thereafter). |
| 2036 | AI begins to see use in industrial automation. | Smart bullet: A hard-shelled, flat-headed bullet with 300 Hz thermal and visual sensors on the front, a small shaped charge judd behind that, a tiny computer behind that, and mobile MEM aerofins along the sides. When fired, the sensors pick up the (human) target aimed at and use the fins to alter trajectory for a one-shot kill. The bullet can manage up to 20 degrees of turning per second, should the target be moving rapidly. Smart bullets are usually fired at approximately 500 feet per second, as most of the killing power is in the shaped charge, rather than the kinetic impact. Most transmit the visual data back to the gun for tactical analysis later. | | Limited quantum AI cheap enough for commercial applications. Dr. Jonathon Harrigan builds the first supercomputer simulation of an entire brain's neural structure, built from microsecond-by-microsecond scans of his own brain. Error creep and system crashes are constant, but while it remains up, it can maintain an extremely convincing conversation. Where it really fails, however is in self-awareness. It even describes itself as "lacking... something fundamentally wrong with my feelings, I can't really connect to myself. I can remember the words, I think, therefore I am", but it simply doesn't make as much sense anymore. Of course I think, that's what processing does..." | Artemis Project: permanent lunar base is constructed, 6-10 people, varying by time of year. Heavy use of the new Galapagos Launch Facility. |
| 2037 | USABLE FUSION At a cost of \$3 billion, a mostly self-sustaining fusion reaction is constructed in space, in a quarter-mile diameter reactor station (Helios II). To keep it going, hydrogen has to be fed to it on a near continual basis, but hydrogen harvested from space costs less energy to harvest than the energy the reactor station puts out. Ultimately, however, the station fails to revolutionize world power; GenIV plants are more efficient and can be built on the ground. Over the next decade, however, the reactor station acts as a power depot for various satellites and university projects. | | Neural code cracked! Scientists begin picking apart the operating system of the brain. Or at least its components. | AI: Based on research with Ada Turing and Dr Jonathon Harrigan, scientists conclude that a sentient computer will be possible at roughly a million times the current complexity level of quantum computers. The Harrigan simulation commits virtual suicide, deliberately burning its hard drives. No note is left, but investigation indicates that it simply failed to keep its depressive activities in check, due to a lack of ability to know when it was depressed. | Helios II put into orbit; this is a nuclear fusion reactor station. It will fail, but will ultimately pave the way for large space stations with permanent crew. Galapagos Launch incorporates. Shares disappointingly undervalued on stock exchange. |
| 2038 | Aerocrete (aerogel concrete) drops to \$500 per metric ton, making it incredibly affordable. | | | Ada Turing clones see some commercial use, but are ultimately abandoned due to the raw volume of programming required to get any use out of them. | Artemis Project: world Webnet lag cut down to speed-of-light lag only. |
| 2039 | In an attempt to make Helios II more economically attractive, a secondary fission plant is completed which cycles the fused tritium back into deuterium. Although this reduces the energy output of the facility, it also reduces the hydrogen intake significantly, making the energy "almost free". A number of satellites are retrofitted to accept "laser-beamed power" from the reactor station. | | Neural "Gibson Jack" tested in a laboratory setting. Harnesses visual center (particularly third eye) to generate on-screen pattern direct from the brain, type on a virtual keyboard, and activate events. | New problem solving algorithms (particularly AI-driven solvers) begin to see heavy commercial use. Houston, TX institutes an AI driven "traffic cop" computer system to manage traffic and suggest highway improvements. New York City, NY does something similar for taking population polls. | Artemis Project expanded to 20 people. China begins program to construct a lunar base, but safety concerns slow the project to a crawl. |

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| 2040 | | | | Webnet 3.6 includes robust support for local networks (primarily in firewalling, general security, and protocol translation). Also includes more fault tolerant protocol for quantum communication. June Corp, a startup built around the idea of buying other corporations, utilizes AI-driven analysis to pick buyouts, and demonstrates that it scales. Larger money amounts can be grown equally rapidly, simply by having more AIs buying ever larger numbers of small corps. A boom of AI-driven analysis begins. | |
| 2041 | EZZippers lead to very risky clothing styles. | | | AI-driven analysis becomes ineffective by the end of this year. It now required simply to be competitive, but no longer affords any real advantage; just more complexity. | Trickle back technology from the Artemis Project begins to help pay for the lunar station. Trickle back includes the EZZipper, tooth foam, various materials technologies and "pressureless" hoses. |
| 2042 | | | | Language parsing reaches its peak; biocomputers can now comprehend and translate between a huge number of languages, including many which are essentially extinct. | Plans to build a space elevator shift attention to equatorial Africa; this would be the ideal place, due to lack of room for anchoring at Galapagos. |
| 2043 | | Experiments in the military on brain-controlled vehicles somewhat successful, but more research and testing will be needed. Also, it is definitely NOT plug and play. | | Computer speed is no longer an issue; fingertip sized computer is more than most people can use, and costs under \$1000 (US2000 dollars). Computer industry advancement levels out; university research continues to push the envelope, but at a much slower pace (doubling every 3 years). | Artemis Project and Galapagos Launch Inc sign contract to install a dedicated mass driver on the moon. The total cost for the mass driver will be \$45 million dollars, spent over a ten year period. |
| 2044 | The Ultrawalker: A thought-controlled wheelchair with a telescoping robotic arm that can travel at up to 15mph, lift slightly more than 100 pounds, turn and brake on a dime, maintain its balance in rough conditions, and generally get you where you want to go. It costs \$3,000. | | The Ultrawalker: A thought-controlled wheelchair with a telescoping robotic arm frees up paralysis victims. | Hilda Ravi-Lensky programs and publishes EveOS in conjunction with a modern wearable package. EveOS' primary claim to fame is that it was built from the ground up for wearables, rather than modified for their environment. It is also the first OS to use AI technology in a significant fashion (this will be mimicked later as PAIA). | Alpha Centauri mission proposed at NASA (sending a probe to flyby the Earth-mass planet in that star system). A Helios fusion-fission system may provide sufficient long-term power to arrive at the star within 41 years (at 0.01G acceleration, and a massive volume of Hydrogen). The Chinese-Congo launch facility opens in Equatorial Africa. |
| 2045 | | | | The divide between those who can afford higher-power AI-driven analysis, and those who can not, begins to increase substantially. AIs which predict behavior of lower-class AIs begin to see use, although gains are more gradual. Note that this does not really affect computer speed -- at issue is the data bandwidth and improved algorithms. | |
| 2046 | | | | PAIA (Personal AI Assistant) systems begin to see use. These interface using earbuds, mics, MEM gyro gloves, and the ability to comprehend words, direction of gaze, GPS data, online maps, gestures and more, and bring information important to you on a continuous basis. A complete PAIA unit costs about \$8,000, mostly for the programming, data acquisition and tech support. PAIA computers are not true AI - they are built using technology gleaned from analysis of how "true" AIs work. | Quantum communications platform is installed on the moon for the Artemis Project at a total cost of \$60 million. This is (historically) their largest single expense, paid for by NASA scientists who want access to the lunar station. |
| 2047 | Helios II (a fusion reactor station) sees much use by satellites and university experiments due to its very cheap power, but has failed as a financial venture. The reactor station is purchased by Russian military interests (who want a reliable, cheap energy source in space at the time), who agree to continue to make it available to a certain number of research projects per year. | Jeep Hardcore released for field testing in the military. Built on a jeep frame, with light tank armoring and a more streamlined shell, a single pilot sits at the center, jacked into the extensive computers. The Hardcore pilot receives sensory data and controls the jeep directly through the interface. Observers describe the jeep as "nimble". | | EveOS 2.0 (your friendlier, neighborhood PAIA) goes to market, re-establishing dominance. | Project Centauri I begins construction; NASA intends to put a small probe in orbit in the Alpha Centauri system (4.3 ly away) using a slightly smaller version of the Helios II. |
| 2048 | | | Neural "Gibson Jack" becomes a reality; you too can control your OS directly, for only \$1500. | A fingertip sized computer that is faster than anything you could possibly need is \$100. Neural "Gibson Jack" becomes a reality; you too can control your OS directly, for only \$1500. | Galapagos Launch Facility upgrades, roughly halving costs to get into space. |
| 2049 | | | | | |
| 2050 | | | | A "fully rational" AI biocomputer is built in a laboratory setting. Many bugs to iron out, but AI peers hail it as "The Shortcut" to full AI they've been needing. | The Artemis mass driver is delayed by funding issues. |
| 2051 | | | | EveOS 3.0 is released to market. Includes support for Gibson Jack and improved PAIA functionality. | Project Centauri I completed. Launch occurs with little fanfare. Expected to arrive in 2092. |
| 2052 | | | | Ada 2 is built; a mixed-breed "rational biocomputer" and high-speed computing "nodes", Ada 2 is intended for commercial use. Ada2 is a pure logic system, but carries many human-seeming traits: the ability to establish specific goals based on broad statements of purpose; to intelligently analyze a situation based on those goals; and to make recommendations. Without a goal provided by an outside source, however, an Ada2 feels no inner urge to do something, does not get bored, does not experience the passage of time. | |
| 2053 | | | | | |
| 2054 | Scientists in China manage a (comparatively) cheap method of generating antimatter; \$1 billion per gram of antimatter (compared to \$6.4 quadrillion previously). Still too expensive for any real use. | | | In the face of flagging sales, Hilda Ravi-Lensky releases EveOS 3.0 source to the public domain and tries to move to fee-based support. Over the course of the next year, Hilda will fade from the infotech scene, as it becomes more and more difficult to make money at it. | China offers additional funding for Artemis Project mass driver in return for "a Chinese presence" at the base. |

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| 2055 | | | Nanocell surgery research hits a breakthrough with a nanocell that is five times as large, but capable of far more adaptation to a dynamic environment, and produces less waste heat. | | Chu Ming-Wei, a respected Chinese scientist and engineer, moves into her permanent quarters on the moon. Every effort is made to accommodate her laboratory needs. |
| 2056 | High speed, reprogrammable cell nanofacs begin to undergo construction. Many herald this as the "coming of the nanotech age". However, the nanotech age will fail to have any severe impact for quite some time. | | | Ada 2 is constructed using a cell nanofactory for \$500. | Artemis Project's mass driver is completed. The lunar station now offers cheap construction and launching of Earth-orbit satellites (\$2 per kilogram, not counting construction). Part of the profits go to Galapagos Launch Inc; most of the rest go to buying off NASA's credit. |
| 2057 | | | | The first Ada 2 biocomps see commercial use, with a high rate of success. | |
| 2058 | | | MicroGibson designed. The actual computer is about the size and thickness of a fingernail, but has nanocell built strands which "grow" into the brain, guided by external computers. The "jack" itself is wireless, and transmits to a spot just above the left ear (where a earpiece computer is needed). The MicroGibson currently does the same things as a Gibson, but unlike the Gibson it can upgrade itself as new capabilities become available. | MicroGibson designed. The actual computer is about the size and thickness of a fingernail, but has nanocell built strands which "grow" into the brain, guided by external computers. The "jack" itself is wireless, and transmits to a spot just above the left ear (where a earpiece computer is needed). The MicroGibson currently does the same things as a Gibson, but unlike the Gibson it can upgrade itself as new capabilities become available. | |
| 2059 | The first high speed, reprogrammable cell nanofac finishes construction. Owned by June Corp, it is fully Webnet accessible; anyone can queue in a design they want, pay for materials + time + 10% markup + shipping, and have their design shipped to them as soon as it completes. The entire process is automated, and is pretty much designed to roll profits into June Corp with very little overhead. | | | | |
| 2060 | Interest in fusion power returns. | | Nanocell surgery becomes available to the masses. | EveOS 3.2 released by open source hackers. Primary upgrade is use of the MicroGibson. | Artemis Project takes a loan from Galapagos Launch Inc to purchase the mostly-defunct Helios Corp, and begins construction of a lunar-based fusion reactor. |
| 2061 | | | MicroGibson costs \$200 and an hour at a local clinic to install. | | |
| 2062 | Legal problems with June Corp's "personable nanofac" begin to crop up; people are building things for which other people possess the patent, or which are outright illegal (see Politics, Western Europe). June Corp weasels out of the issue by turning over user names to the authorities, allowing them to pursue individuals who "abuse" June Corp's nanofac. | | CryoLabs puts together a nanocell system that takes genotyped information and brain scans as a blueprint for repairs, and repairs the body as it thaws. Some of the worst damaged bodies can not be thawed at this time, and frozen heads can not yet be handled. The first cryo survivors begin to be awoken, as the damage to their system can now be healed. For survivors, there is memory of a "dark, bad time" in between, occasional brain damage, and small glitches in self continuity that are difficult to pin down. Over the course of the next two decades, these will become largely repairable problems (except for the dark, bad time, which will remain a common experience of those who take the ice exodus). | | |
| 2063 | The construction of Helios III at the Artemis Project lunar station is important for several reasons. First, it was built completely by robots, from materials on the moon, for a net cost of a paltry \$3.5 million, compared to traditional methods for \$3 billion. The immensely reduced price was a combination of abundant lunar materials, low gravity, and technical know-how. Secondly, although considered frivolous by most, energy on Luna became functionally free... even for the mass driver. From this point on, construction of practically anything on Luna costs only the time to program robots. June Corp loses a ton of money, as their "higher than Luna" prices combine with their customer dissatisfaction. | | | | Artemis Project completes their fusion reactor, Helios III, for the astounding cost of \$3.5 million. Much of the credit is actually given to Chu Ming-Wei. |
| 2064 | | | | The Deliverator worm hits: targeting MicroGibsons, it programs them to link to the ocular system and begin transmitting images to various anonymous websites. | |
| 2065 | Various manufacturers begin to enter contracts with Artemis Station and Galapagos Launch Inc to construct and launch items for pickup on Earth. Over the course of the next three years, Artemis Station's profits will jump by several orders of magnitude to roughly \$4 billion annually, and prices for "moon-reproducible" products will drop a great deal. Fusion powerplants based on Helios III but built on Earth begin to undergo construction. Unfortunately, the abundant raw materials of the moon are simply not available, and it will be many years before they begin to have any real impact on the economy. | | Combined with neuraltech, a procedure for constructing a host machine for a frozen brain is devised. A few heads are revived successfully, as true cyborgs. | | Galapagos Launch Facility further reduces price to LEO to \$20/k (scales up nicely) |
| 2066 | Moriarti, an anonymous black hat hacker, manages to trick the June Corp system into building and shipping a small nanofac to an address in Ireland. Moriarti acquires the nanofac and goes into hiding. This is not discovered until a year later, during June Corp's dissolution. | | | Russia: MortMan, the creator of Deliverator, is captured. He is imprisoned with an astonishing lack of consideration for his rights. | Artemis Station expands to 150 people, and begins planning for more (total project members is 25,000 people, and the Artemis Project is planning to get at least that many on the moon). |
| 2067 | June Corp ceases to exist, and their nanocell factory is destroyed. | | Ambulances in Europe begin to haul portable cryochambers as part of their equipment; many victims who are legally dead on-site can now be repaired back to life at the hospital. | | Artemis Station expands to 800 people, and renames itself to Lunar City. Lunar City begins a program of "back wages" for its many project members to pay their way "up". |

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| 2068 | | | | | Lunar City expands to 6,000 people. China recalls Chu Ming-Wei. She claims an inability to "come down", due to political friction between US-Russia Alliance and Lunar City. Also suggests that China needs an embassy on the moon. |
| 2069 | | | MicroGibson capable of full sensory recording and editing, including real-time modification of what you see. | Complete, perfect virtual reality seems possible. Fears of a new, more insidious Deliverator make acceptance of the new technology difficult. | Lunar City expands to accommodate 30,000 people, and begins accepting talented immigrants (non-members). |
| 2070 | | | | | |
| 2071 | | The first Earth-based fusion plant is completed. Another twenty will be completed over the next two years. While not as efficient as Helios III (mostly due to environmental factors & acquisition of hydrogen), they are still "free energy". | | | |
| 2072 | | China completes their Helios-like first fusion power plant. | | | Lunar City moves slightly to the perpetually dark South Pole, shifting deeper into a nearby mountain range. |
| 2073 | | Further refined techniques for producing antimatter are developed in China. Cost is \$25 million per gram, almost cheap enough to be considered for interstellar space flight (roughly 100 kg, or \$2.5 trillion, would be needed to get to Alpha Centauri). | | Ada3 is released; mostly represents incremental improvements in the algorithms, and specific capabilities requested by customers. | |
| 2074 | | | | | |
| 2075 | | | | | |
| 2076 | | | | | |
| 2077 | | Fusion-fission "free energy" power plants slowly replace just about every other form of power, although wind and solar power are retained as supplements. And the energy is still charged for, naturally, just far cheaper. Antimatter costs roughly \$500,000 per gram, with most of the cost deriving from facilities and human operators (high energy particle manipulation is still not trusted to AI). The energy cost is negligible. Note: Antimatter still costs more energy to make than it produces, thus, it is potentially useful for space travel (for its energy density), but will likely never replace fusion as a power source. | | | |
| 2078 | | | | | |
| 2079 | | | | | |
| 2080 | Importantly, the Hall Nanofac is fast and flexible , able to construct an entire economy of scale in a way that Cells can't. Twice as many Cells yields the same amount in 1/2 the time; twice as many Hall Nanofacs yields more specialized sub units, and 1/4 to 1/10th the time, plus the ability to rapidly reproduce. The Nanotech Revolution has arrived... at least, for the wealthy. | The Hall Nanofac is first put into production at a US research facility. A Hall Nanofac is actually an entire, self-contained industrial base at the nanotech scale, with individualized units for control, part manufacturing, part assembly, materials transport, and so on. A Hall Nanofac starts life as a seed in nano goop which uses its surroundings to construct the sub units; it then directs these sub units to build another H.N. It does this a few times and then begins construction of sub units to help the other H.N.s get up to speed; they, in turn, repeat the process. The result is a rapid accelerating proliferation and an extremely flexible nanofac that can scale itself to new problems. | | | |
| 2081 | | | | | |
| 2082 | | | | | |
| 2083 | | | | The Moriarti Complex is discovered on the Webnet. Built around message boards, with encrypted cash payment agreement systems, it allows people to anonymously order items from Moriarti's nanocell factory. Unfortunately, discovering it does not lead to where Moriarti is, or any information on what has been ordered. Nor does it even shut them down - the message boards become a game of whack the mole. | The Moriarti Complex is discovered on the Webnet. Built around message boards, with encrypted cash payment agreement systems, it allows people to anonymously order items from Moriarti's nanocell factory. Unfortunately, discovering it does not lead to where Moriarti is, or any information on what has been ordered. Nor does it even shut them down - the message boards become a game of whack the mole. |
| 2084 | | | | The Moriarti Complex encryption software becomes publicly accessible, and more anonymous services begin to crop up on message boards. | |
| 2085 | | | | MicroGibson "enhanced reality" becomes fairly common among college students. | |
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| 2090 | | | | | |
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| 2092 | | | | Quantum computer capable of simulating the human brain, including all sub-neural quantum activity. Constructed in university research. Ada Corp buys it, the buries it under legal pressures. | The Project Centauri I probe arrives in the Alpha Centauri system and enters a stable (close) orbit around Alpha Centauri A. Photos will not actually arrive on Earth until 2097. |
| 2093 | | | | | |
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| 2097 | | | | | The first photos from Project Centauri I arrive on Earth. They confirm previous measurements of the system's planetary bodies (including the lack of habitable planets), and raise a few questions, but are mostly interesting for the achievement of 50s technology. |
| 2098 | | | | | |
| 2099 | | | | | |
| 2100 | | | | Rain Man, a completely software-based simulation of a human brain (whose brain is unknown), is discovered wandering the net encased within a Rain Man-controlled worm that allows him to "travel" from network to network on Webnet. He disappears shortly thereafter, and a Webnet-wide hunt begins. | |
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| General Comments | Industry power, manufacturing processes, resources, transportation | Military | Biotech Medicine, cybertech, gengineering, biomods | Infotech Communications, computers, data analysis, memetics | Space |
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