Brave New World
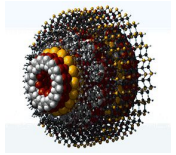
Ultratechnologies will allow us to design a wonderful world. Will we?

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What are ultratechnologies?

Nanotechnology

- Richard Feynman gave speech on Dec. 29, 1959 called "There's Plenty of Room at the Bottom".
- Norio Taniguchi coined the term "nano-technology" in 1974.
- K. Eric Drexler unknowingly used a related term in *Engines of Creation: The Coming Era of Nanotechnoloy* (1986). He and Christine Peterson founded the Foresight Institute (1986) with the mission: *Preparing for nanotechnology*. Drexler's 1991 PhD thesis was published as *Nanosystems: Molecular Machinery, Manufacturing and Computation* (1992).
- Robert Freitas, Jr. did a lot of theoretical work on nanomedicine. Ralph Merkle joined forces with him in order to develop the technology.

Richard Feynman
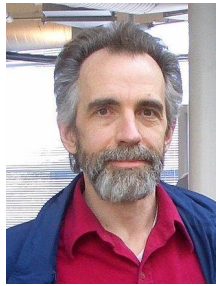
Eric Drexler

Christine Peterson

Rob Freitas

Ralph Merkle

- The original term was extended to include other technologies and material chemistry at the nanoscale, and thus other terms have evolved to describe the original meaning: molecular nanotechnology (MNT), nanomanufacturing (or nanofacturing), Atomically Precise Manufacturing (APM), productive nanosystems, nanorobotics, etc.
- The technology is incredibly powerful. Like all technologies, it can be used for good or bad.
- Good nanotechnology can perform feats that will seem miraculous.
- Negligent or malicious uses can be dangerous.
- Application in diverse fields: medicine, industrial, environmental, space...
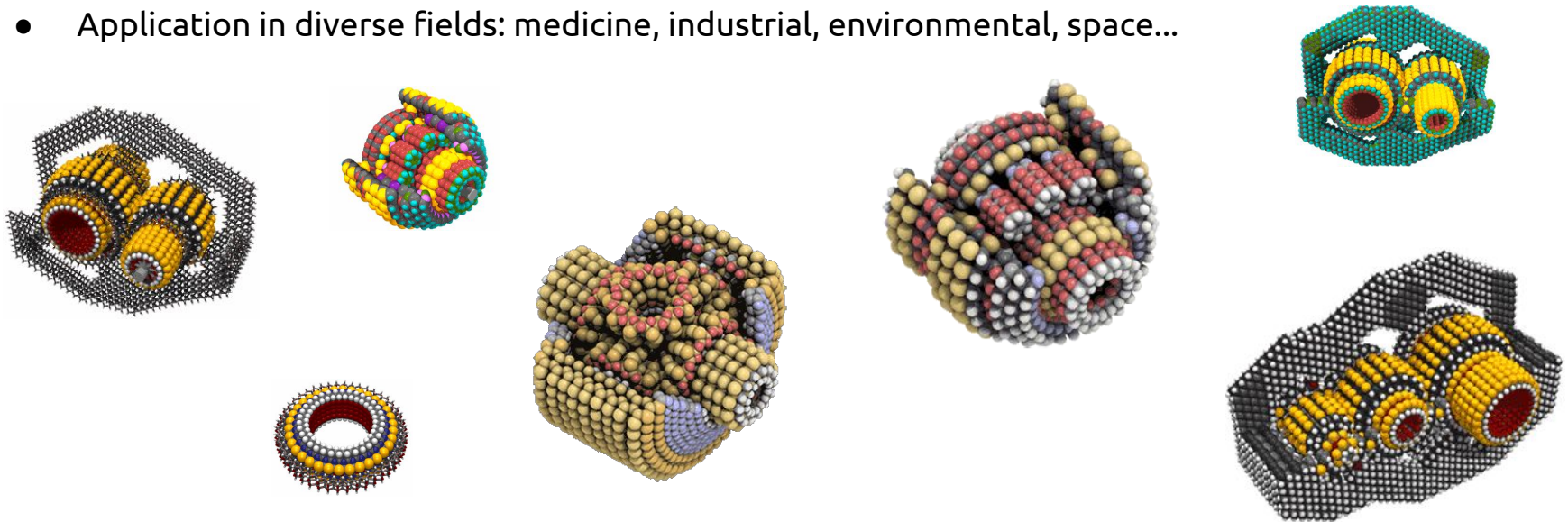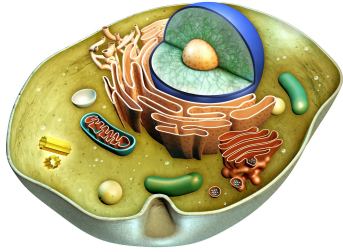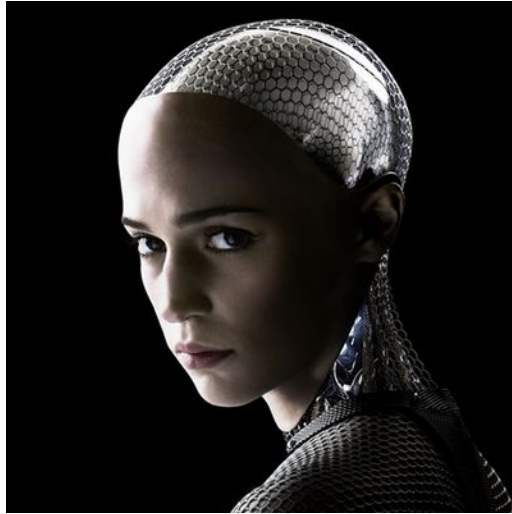
Biotechnology

- Area of biology involving living systems and organisms to make products.
- "Any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use" (UN Convention on Biological Diversity, Art. 2)
- It overlaps with many related fields: molecular biology, bio-engineering, biomedical engineering, biomanufacturing, molecular engineering, etc.
- It includes some new sciences, such as genomics, recombinant gene techniques, applied immunology, etc.
- **Biotechnology has been invaluable** in our global fight against malnutrition and famine.
- **We see biotechnological "miracles" every day**. It's an exciting period. As we gain knowledge and tools, the world of medicine is being revolutionized at an exponential rate.
- It is no wonder that biotech is seen by longevity advocates as an **essential tool in our fight against aging**.

Artificial General Intelligence

- The development of "general" intelligences, capable of reading and understanding anything, have perfect memory, accomplish complex logical and moral reasoning, etc.

What types of things can we do with these?

- **Radical abundance, the nanotechnology revolution.** Desktop nanofactories will allow us to reach true material and energy abundance very quickly. Need and poverty will become obsolete.
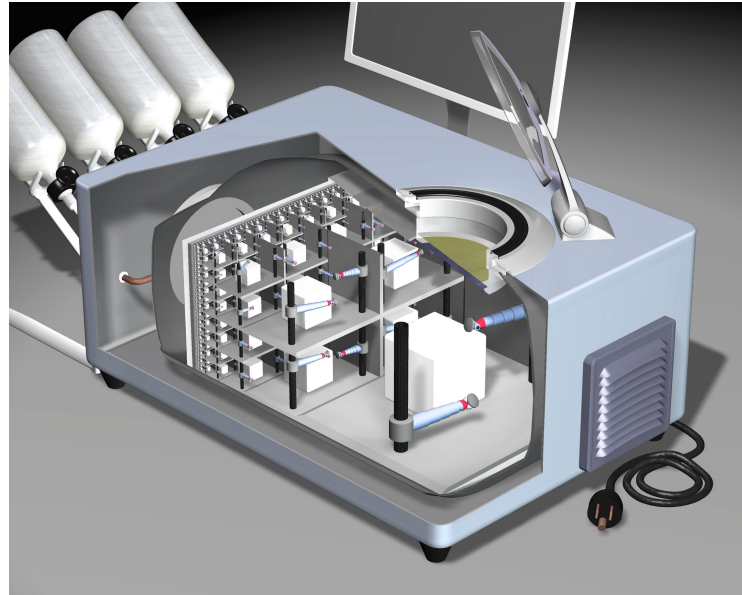
- **The robotic revolution, and the "intelligence explosion"**, one of the main characteristics of the technological Singularity.

"Paradise engineering". Philosopher David Pearce is a pioneer in this field. Paradise engineering would include projects like…

- **The elimination of involuntary aging and death.**
- **The elimination of involuntary suffering, both human and nonhuman**, including the end of animal agriculture and fishing, and even the alteration of natural trophic chains (natural predation); the design of ethical alternatives, including processes to transition from natural trophic chains to artificial, or semi-artificial ones.
- **The ultraefficient use of resources**, indefinite material/atomic recycling, **environmental cleanup, geoengineering, control of the climate.**

- **The space revolution** - space is an endless source of energy, materials and... adventures!
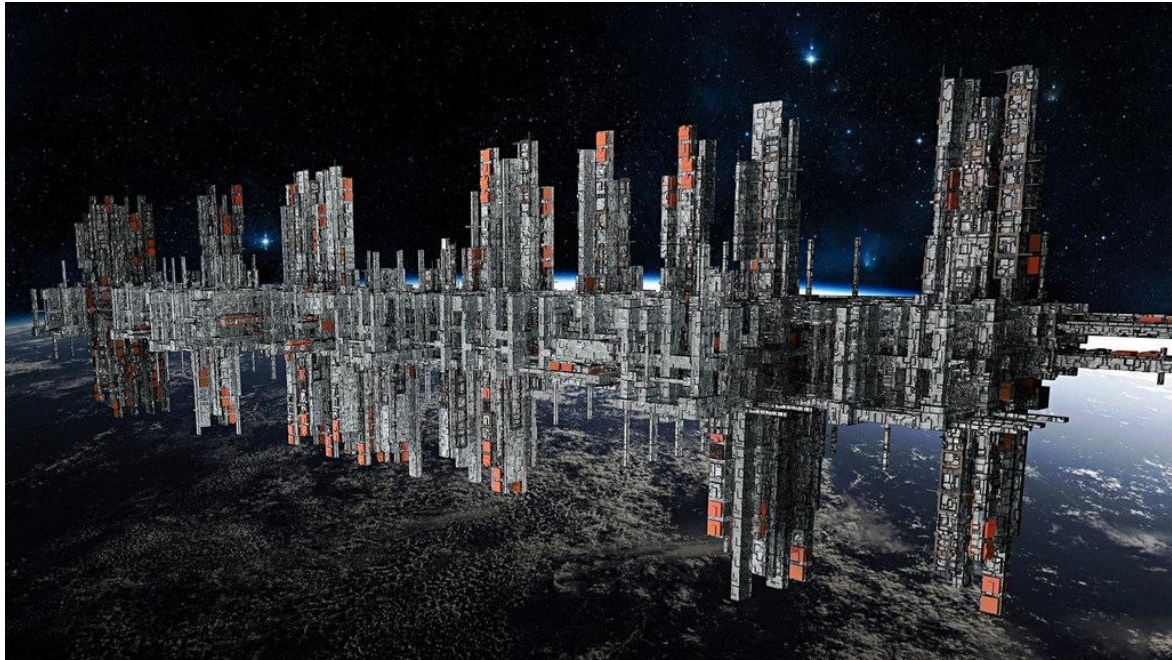
- **In short, we will have the means to create a happy world**, where all (known) sentient beings are protected from abuses and danger, permanently.

With these technologies at hand, great feats like the space elevator, or the end of aging, will be relatively easy to achieve.

What types of dangers must we face?

- **Global catastrophic risks, and existential risks**. Each ultratechnology has associated with it some risks, which we can't avoid:
  - Both nanotechnology and biotechnology require certain levels of control, of transparency and constant global monitoring, so that they don't "go rogue", potentially causing death and destruction in a large scale.
  - An "immoral" or "amoral" artificial general intelligence, or which goals are not aligned with ours, can prove dangerous, since it will quickly become much smarter than us. Orders of magnitude more intelligent and capable.

- **Our disastrous global governance.**

- **Technounemployment.**

- **Enormous**, unacceptable **present suffering** (both human and, generally, "sentient"), **and potentially astronomical future suffering**.

Por fortuna, para cada riesgo o peligro, podemos diseñar soluciones, hacer planes y acción política, para mitigarlos

Problema/riesgo	Posibles acciones
Technounemployment	Universal Basic Income and similar schemes. Radical abundance. New horizons: the space age.
Bad global governance	Get involved in both political theory and political action.
Bad subglobal/national governance	Get involved in our nations' politics, in political processes, etc.
Present suffering	Use social and political action, as well as ultratechnologies, to bring it to a minimum.
Future suffering	Theorize and begin to design a legal framework to protect future beings.
Global catastrophic risks	Multiple avenues: see next slide.

Riesgos catastróficos globales y riesgos existenciales

Problema/riesgo	Posibles acciones
Thermonuclear war.	Diplomacy. Disarmament. Vigilance. Design of defensive systems which make them obsolete.
Biotechnology.	Transparency. Monitoring of relevant substances and industries. Global fight against terrorism (via re-education programs, etc.)
Nanotechnology.	Specific legislation about nanofactured products to avoid the private use of desktop nanofactories. Necessary legal supervision/approval of each design.
Artificial intelligence.	Design of control systems and redundant "gates" to avoid damages. Education of advanced AIs to make them experts on ethical reasoning. Progressively merge with AIs.
Asteroids or meteorites.	Early detection systems and deflective systems.
Supervolcanoes and strong earthquakes.	Ultra-resilient/safe constructions in danger zones, and evacuation plans. Use of molecular nanotechnology to contain natural catastrophes.

In order to improve our chances to survive the big global problems and risks, it is very important, or would be very convenient, to have:

- **World peace**. It's very important to avoid great wars.
- **Diplomacy and cooperation** at all levels.
- **Financial/monetary stability in advanced nations, and urgent improvement of developing ones**. The great crisis in the most advanced nations delay progress, destroy economies, cause a lot of suffering, and increase internal and external tensions.
- **The establishment of public health systems everywhere**.
- **Better global governance**. The desired liberation of the world's population: the end of tyrannies, dictatorsphips, false democracies, etc.
- **A much more transparent world.** Multi-directional transparency.
- **Individual liberty and wellbeing** of as many human beings as is possible. In particular, the empowerment of women, and the protection of children.
- **A proper and rational education of the global citizenry**.

How can we improve global governance?

- **We must be able to do full-sample polls and vote together in elections and referendums. This would entail a moral obligation to *educate everyone*,** so that all voters have a **minimally sufficient cultural level in order to be able to decide in an informed manner.** Someone's mere age doesn't guarantee that the person is sufficiently informed to vote judiciously.
- Paco Mota, in his book ***If Darwin and Socrates, Global Sciocracy***, has suggested the creation of an **Advisory Parliament for Humanity**.
- With a **Concert of Democracies**, a type of United Nations exclusively for who pass certain standards of freedom and democracy.
- *The current UN system, with Permanent Members on the Security Council with veto power, is obsolete, unjust and indefensible, long term.* However, **it would be positive if the UN itself led the changes and reforms to its own workings**.
- Nations are mere historical political fictions. Sooner or later, **national borders will be removed**, as they are primitive and injurious. In principle, the European Union aspires to it. We must aspire to a European Union which includes the whole planet.

What should be humanity's (long term) objective?

- **If we manage to end suffering on Earth, what would be next?**
- **We could simply explore the universe.**
- If unconsented suffering is undesireable, it is undesireable regardless of where it happens. Due to moral coherence, **we should explore the universe in order to:**
    - **Find any possible extraterrestrial .**
    - **Determine whether it's sentient, and whether it suffers.**
    - **Reduce or eliminate that suffering.** For hundreds of millions of years, billions of creatures have suffered on Earth. We have a moral imperative to reduce that suffering. Although we don't yet have such capabilities, the day may come when we will.

In short

- **Ultratechnologies are coming, want it or not**… so the most intelligent way forward is to get informed, prepare, and keep them in mind. We must promptly design a legal framework, design permissive but cautious policies, in order to avoid possible dangers.
- **There is a lot to do**. Most of the work is ahead of us. We must get informed and get involved. We must raise awareness and educate other people so that they get involved too.
- **We should all get involved in the fight against aging** and involuntary death. There are many ways to do it. For instance, by supporting SENS and other aging-combatting organizations financially. Or social and political activism so that individual citizens, organizations (universities, pharma companies…) and governments get more involved.
- **There are reasons for optimism and hope, but we must be mindful of the risks, and get busy.**
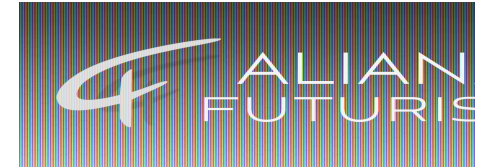
Some organizations which I suggest that you support

sens.org

humanityplus.org

alianzafuturista.es

intelligence.org

gcrinstitute.org

futureoflife.org

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- Philippe van Nedervelde and Paco Mota, for their great support and friendship.
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