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Warsaw, Poland  
Yerevan, Armenia

## Examples for the UN Office of Strategic or Existential Threats:

### Loss of control over future forms of artificial intelligence

If the initial conditions of Artificial General Intelligence (AGI) are not “right,” it could evolve into the kind of Artificial Super Intelligence (ASI) that [Stephen Hawking](#)<sup>i</sup>, [Elon Musk](#)<sup>ii</sup>, and [Bill Gates](#)<sup>iii</sup> have warned could threaten the future of humanity. Artificial Narrow Intelligence (ANI) is the kind of AI we have today: each software application has a single specific purpose. AGI is similar to human capacity in novel problem-solving whose goals are set by humans. ASI would be like AGI, except that it may emerge from AGI and sets its own goals, independent of human awareness or understanding. It may take [ten to twenty years](#)<sup>iv</sup> to create AGI. Since it may take that much time to create a global governance system to make sure the initial conditions are right. If so, then we should begin working to create such global governance now. Intense pressures of competition among corporations and states for advanced AI could lead to inadequate initial conditions without such global governance.

### Massive discharges of hydrogen sulfide (H<sub>2</sub>S) from de-oxygenated oceans, caused by advanced global warming

Global warming is beginning to change ocean currents. If this trend continues, water conveyors that bring oxygen to the bottom of the ocean will stop. Micro-organisms that proliferate without oxygen emit hydrogen sulfide (H<sub>2</sub>S – a deadly gas) when they die. This, plus ozone depletion, may have killed 97% of life during the [Permian extinction](#)<sup>v</sup>. Also in our future could be desperate attempts at geoengineering that go astray.

### Weakening of the Earth's magnetic shield that protects us from deadly solar radiation

The Earth’s magnet fields weaken as the magnetic poles reverse. The last reversal was [42 million years ago](#)<sup>vi</sup>, and scientists predict the earth is due for another one. The process of reversal can take hundreds of years, during which time humanity and all life will be [vulnerable to deadly radiation](#)<sup>vii</sup> worldwide.

### Malicious nanotechnology (including the "gray goo" problem)

There are two approaches to nanotechnology: big machines, making nanotech that we have today, and atomically precise manufacturing and self-assembly that we do not have yet. Theoretically, the second version could take CO<sub>2</sub> from the air, strip out the oxygen, and make massive carbon nanotech structures, with nothing to stop it. This uncontrolled self-assembly is referred to as the [gray goo problem](#)<sup>viii</sup>.

**A [single individual acting alone](#), could one day create and deploy a weapon of mass destruction (most likely from synthetic biology)**  
Synthetic biology that mixes genetic material from different species could

make a new kind of virus living outside the body for deployment around the world, with a long incubation period. National technical means can identify and disrupt such actions, but probably not all. Improving applications of cognitive science and child development psychology could reduce such insane people, but not all. Families and communities can also help reduce the number of such mass killers. Technologies will continue to become more powerful, decentralized, and [easier to use](#)<sup>ix</sup>, so strategies to prevent misuses should increase—globally—as well.

### **Nuclear war escalation**

Although nuclear war was prevented between the USSR and the USA, the number of countries with nuclear weapons has grown to nine: United States, Russia, France, China, the United Kingdom, Pakistan, India, Israel, and North Korea. Since there political tensions among several of these the possibility of war is not zero. In addition to deadly radiation, [Carl Sagan](#)<sup>x</sup> and other scientists explained that firestorms created by the nuclear explosions would fill the atmosphere with sufficient smoke, soot, and dust circling the globe interrupt plant photosynthesis stopping food supply.

### **New Uncontrollable, more-severe pandemics**

As synthetic biological research advances and proliferates, the ability to create (by accident or design) immune pathogens that continually mutate increases the possibility, although remote, of human extinction. Human-caused environmental changes could also lead to pathogens that could also lead to our [extinction](#)<sup>xi</sup>. While no single pandemic is likely to extinguish humanity, they may do so in combination with other catastrophic threats.

### **Particle accelerator accident**

Some scientists consider it possible that future particle accelerator experiments could [possibly](#)<sup>xii</sup> destroy the Earth and even open a [blackhole](#)<sup>xiii</sup> or create a phase transition which could tear the fabric of space. Cold Spring Harbor Laboratory altered its research program when they found an extremely unlikely chance of opening a blackhole, but they determined the possibility was not zero.

### **Gamma-ray bursts**

When [two stars collide](#)<sup>xiv</sup>, a gamma-ray burst originating thousands of light years away, could sufficiently damage the protective ozone layer to kill life on earth. According to Dr. Adrian Melott of the Department of Physics and Astronomy at the University of Kansas, "We don't know exactly when one came, but we're rather [sure it did](#)<sup>xv</sup> come—and left its mark." The WR 104 star system could cause such a gamma-ray burst in the future. The Sun could also emit high-energy flares, damaging our ozone layer.

### **An asteroid collision**

An asteroid large enough to end humanity missed the Earth by six hours on March 23, 1989. If it would have hit the Earth, the impact would have been the equivalent of a thousand of our most powerful nuclear bombs. NASA is identifying and tracking such threats now. Although some have proposed attacking an asteroid with an explosive device, but this could result in multiple hits on the earth. Instead, research to find effective ways to change its course may prove safer.

“If humans one day become extinct from a catastrophic collision...Not because we lacked the brain power to protect ourselves but because we lacked the foresight. The dominant species that replaces us in post-apocalyptic Earth just might wonder, as they gaze upon our mounted

skeletons in their natural history museums, why large headed Homo sapiens fared no better than the proverbially peabraind dinosaurs.”

-- Neil deGrasse Tyson (from [Lifeboat Foundation](#)<sup>xvi</sup>)

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<sup>i</sup> <https://www.cnbc.com/2017/11/06/stephen-hawking-ai-could-be-worst-event-in-civilization.html>

<sup>ii</sup> <https://techcrunch.com/2020/02/18/elon-musk-says-all-advanced-ai-development-should-be-regulated-including-at-tesla/>

<sup>iii</sup> <https://www.bbc.com/news/31047780>

<sup>iv</sup> <https://www.technologyreview.com/2020/10/15/1010461/artificial-general-intelligence-robots-ai-agi-deepmind-google-openai/>

<sup>v</sup> <https://www.sciencedirect.com/science/article/abs/pii/S0921818112001452>

<sup>vi</sup> <https://www.sciencenews.org/article/earth-magnetic-field-reversal-mass-extinctions-environment-crisis>

<sup>vii</sup> <https://www.sciencedirect.com/science/article/abs/pii/S1342937X16000319>

<sup>viii</sup> <https://iopscience.iop.org/article/10.1088/0957-4484/15/8/001>

<sup>ix</sup>

<https://books.google.com/books?id=bUbiDgAAQBAJ&pg=PA161&lpg=PA161&dq=A+single+individual+acting+alone,+who+could+one+day+create+and+deploy+a+weapon+of+mass+destruction&source=bl&ots=7msNSpXKBq&sig=ACfU3U3APQVobcrXZUL6EFfBbXwHA2-yHA&hl=en&sa=X&ved=2ahUKEwix7OTi74nzAhUCFVvKFHV-rCQcQ6AF6BAgCEAM#v=onepage&q=A%20single%20individual%20acting%20alone%2C%20who%20could%20one%20day%20create%20and%20deploy%20a%20weapon%20of%20mass%20destruction&f=false>

<sup>x</sup> <https://www.atomicarchive.com/science/effects/nuclear-winter.html>

<sup>xi</sup> <https://www.news-medical.net/news/20210419/Humans-versus-viruses-Can-we-avoid-extinction-in-near-future.aspx>

<sup>xii</sup> <https://www.sciencealert.com/earth-could-be-crushed-to-the-size-of-a-soccer-field-by-particle-accelerator-experiments-says-astronomer>

<sup>xiii</sup> <https://press.princeton.edu/books/hardcover/9780691180441/on-the-future>

<sup>xiv</sup> <https://www.space.com/13221-space-collisions-earth-extinctions-gamma-ray-bursts.html>

<sup>xv</sup> [https://www.nasa.gov/vision/universe/starsgalaxies/gammaray\\_extinction.html](https://www.nasa.gov/vision/universe/starsgalaxies/gammaray_extinction.html)

<sup>xvi</sup> <https://lifeboat.com/ex/asteroidshield#overview>