

# Future of Life Institute Honours Nuclear Winter Pioneers

*Institute honours eight for pioneering nuclear winter research in hopes of refocusing nuclear weapons discourse as states review the Non-Proliferation Treaty.*

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The more decision-makers understand about nuclear winter, the less likely they are to make reckless decisions that may cause it."

*Max Tegmark, Professor of Physics at MIT*

Institute (FLI) has presented eight individuals with a \$400,000 award for their roles in discovering and popularising nuclear winter. The Institute hopes this will help to refocus public discourse around nuclear weapons on nuclear winter as governments meet to review the Treaty on the Non-Proliferation of Nuclear Weapons.

The [Future of Life Award](#) is given annually to those who, without having received much recognition, have helped make today's world far better than it may otherwise have

been. The 2022 Award goes to John Birks, Paul Crutzen, Jeannie Peterson, Alan Robock, Carl Sagan, Georgiy Stenchikov, Brian Toon and Richard Turco for pioneering nuclear winter research and raising awareness of it.

Nuclear winter is the severe and prolonged global climatic cooling likely to result from a nuclear war. Nuclear detonations over fuel-dense areas may start violent firestorms, lofting large quantities of soot and smoke into the stratosphere. State-of-the-art climate models suggest it would envelop the planet, blocking out sunlight. There it would remain for years, chilling the planet and devastating global agriculture.

In 1982, Peterson, then an editor of *Ambio*, commissioned and published the first body of research investigating the environmental consequences of nuclear war. This included Crutzen's and Birks' groundbreaking paper "The Atmosphere after a Nuclear War: Twilight at Noon", which explained how soot lofted into the stratosphere by nuclear firestorms would block out sunlight. The paper was quickly followed by the seminal TTAPS paper, on which Turco, Toon, and Sagan were co-authors, introducing the nuclear winter hypothesis. A model produced by Soviet researchers, including Stenchikov, soon confirmed the TTAPS predictions. Turco, Toon and Sagan, along with Robock, himself a tremendously important nuclear winter researcher, also drove a public awareness campaign spanning decades.

Both Ronald Reagan and Mikhail Gorbachev credited the discovery of nuclear winter with helping to end the Cold War nuclear arms race, thereby reducing the risk of nuclear conflict for decades. Beatrice Fihn, Nobel Laureate and Executive Director of the International Campaign to Abolish Nuclear Weapons, noted that "given the many close calls during the Cold War, by encouraging governments to pump the brakes on the nuclear arms race based on scientific knowledge about the catastrophic consequences of nuclear weapons use, this group of individuals might very well have saved the world by helping avert a nuclear conflict."

Moreover, the discovery of nuclear winter drove further research into the effects of nuclear war, thereby facilitating a more complete understanding of the risks. Whereas the risks were previously understood in terms of the immediate blasts and firestorms, radioactive fallout and the electromagnetic pulse, it is now understood that most casualties would result from nuclear winter and its knock-on effects, such as global famine, epidemics and civil and geopolitical conflict. Such an understanding puts governments in a stronger position to mitigate those risks. This is of particular value now when, due to ongoing geopolitical tensions, the risk of a full-scale nuclear war is widely considered to be at its highest since the 1962 Cuban Missile Crisis.

"The current geopolitical conflict discourse is absurdly cavalier about nuclear war risk", said Future of Life Institute President and MIT Professor of Physics, Max Tegmark. "The latest nuclear winter research confirms that Reagan was right when he said that a nuclear war cannot be won and must never be fought."

The award ceremony took place against the backdrop of states meeting to review the Treaty on the Non-Proliferation of Nuclear Weapons, the cornerstone of the nuclear disarmament and non-proliferation regime. With this in mind, Tegmark added, "in these turbulent times, the more decision-makers understand about nuclear winter, the less likely they are to make reckless decisions that may cause it."

The Future of Life Institute is a nonprofit seeking to reduce extreme, large-scale risks from transformative technologies. It also aims for the future development and use of these technologies to be beneficial to all life.

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