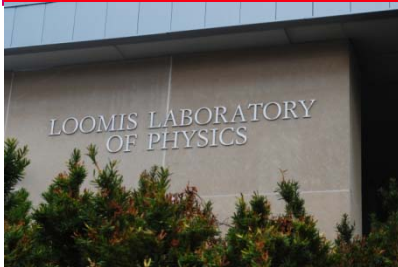


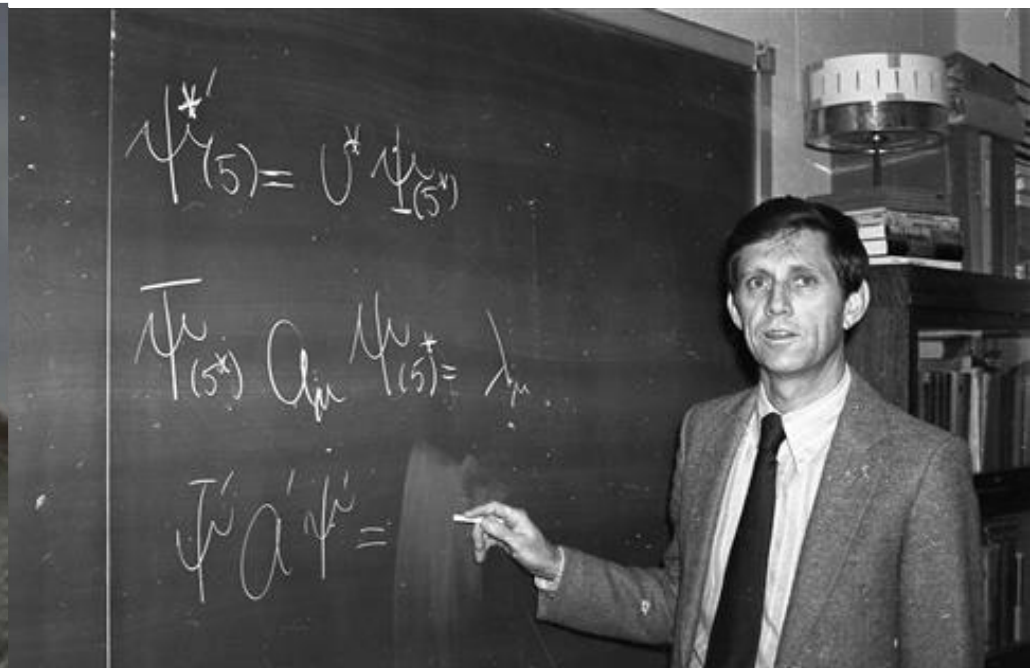
Nuclear Disarmament and Civil Society: The Treaty on the Prohibition of Nuclear Weapons and the Nobel Peace Prize for ICAN 2017



Jürgen Scheffran
University of Hamburg
Research Group Climate Change & Security



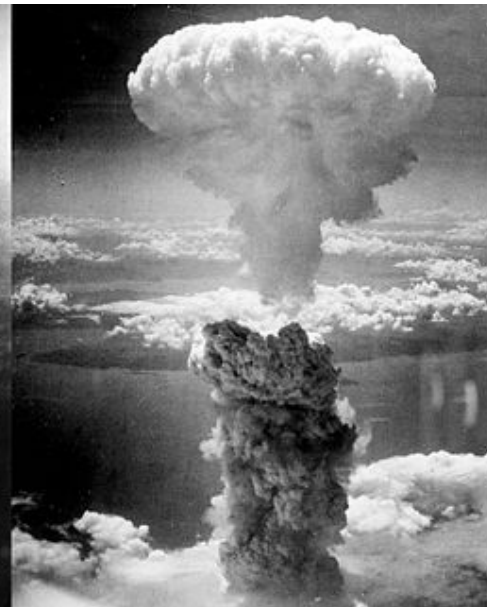
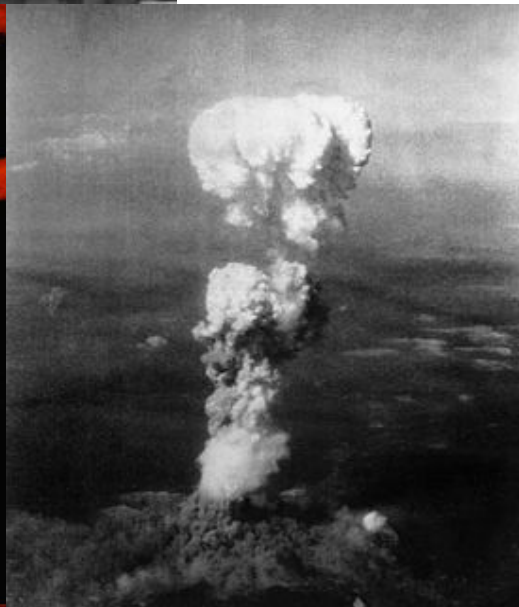
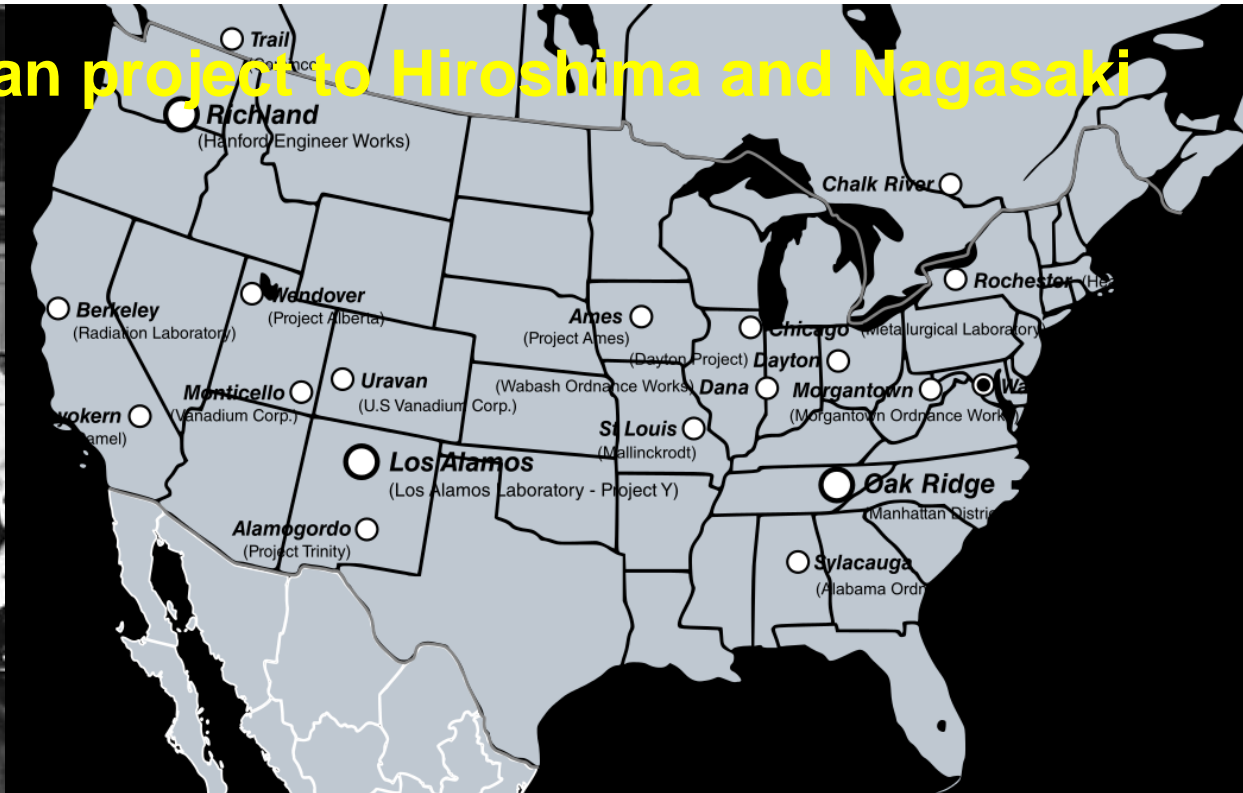
1st Jeremiah Sullivan Memorial Lecture
ACDIS and Department of Physics
University of Illinois, Monday, April 30, 2018



History of Physics 280

- First offered in Spring 1982
 - Course development motivated by concern about the growing threat of nuclear weapons and nuclear war
 - Taught by a team of 13 faculty volunteers from the Physics, Astronomy, and (then) Nuclear Engineering departments
- Second offering in Spring 1983
 - Co-taught by Frederick Lamb and Jeremiah Sullivan
 - Submitted and approved as a regular course
- Has been taught every spring semester since
 - Has served as model for courses elsewhere
 - Most courses elsewhere have died off
 - Physics 280 is arguably the longest running course of its kind

From the Manhattan project to Hiroshima and Nagasaki



Chain reaction of nuclear proliferation

A Chain Reaction of Proliferation

"The Nuclear Express," a new book on the history of the atomic age, describes the interlocking web of influence and espionage behind the proliferation of nuclear technology.

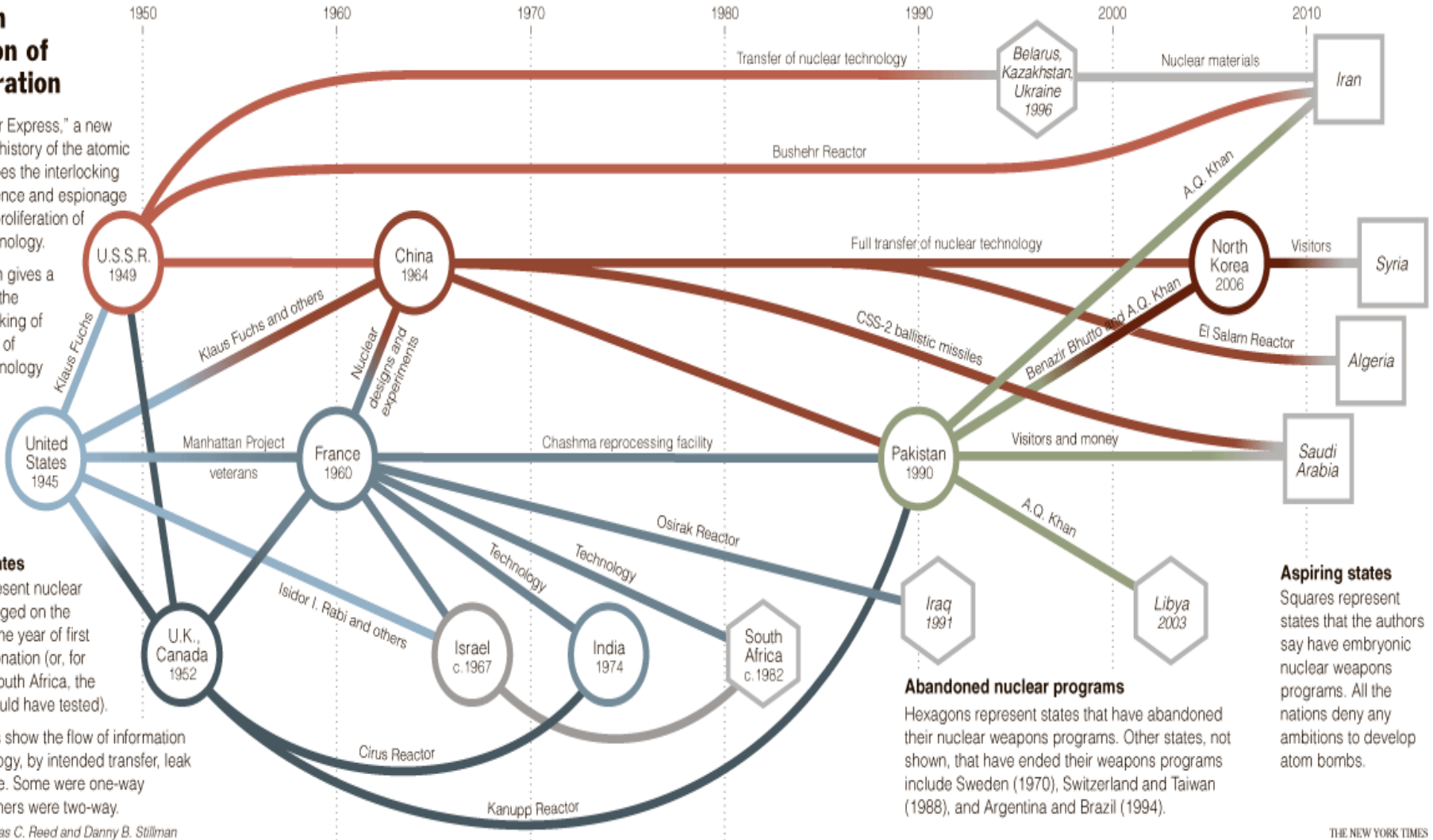
This diagram gives a summary of the authors' tracking of the transfers of nuclear technology and secrets.

Nuclear states

Circles represent nuclear states, arranged on the timeline by the year of first nuclear detonation (or, for Israel and South Africa, the year they could have tested).

Connections show the flow of information and technology, by intended transfer, leak or espionage. Some were one-way transfers; others were two-way.

Sources: Thomas C. Reed and Danny B. Stillman



Aspiring states

Squares represent states that the authors say have embryonic nuclear weapons programs. All the nations deny any ambitions to develop atom bombs.

Abandoned nuclear programs

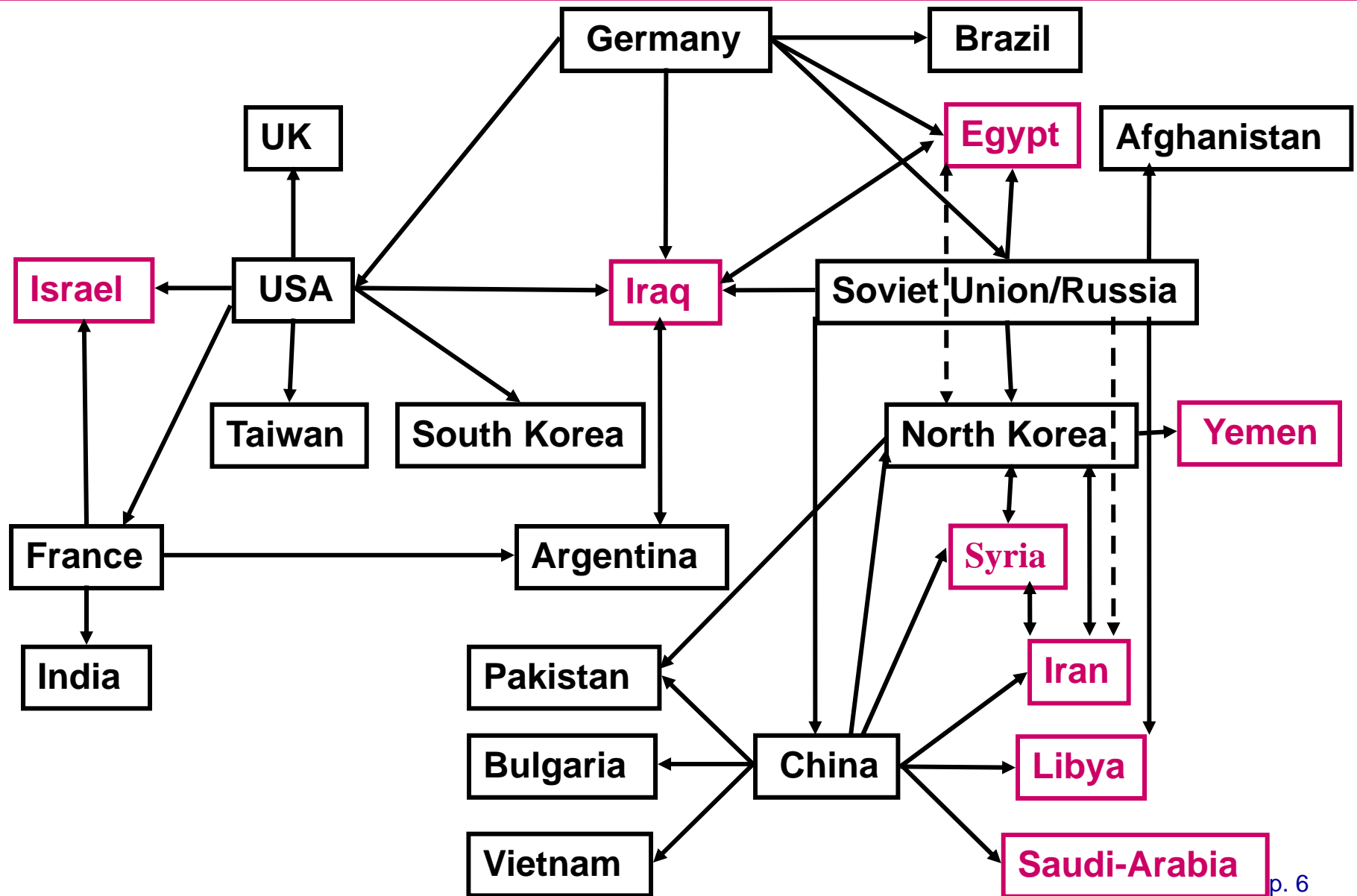
Hexagons represent states that have abandoned their nuclear weapons programs. Other states, not shown, that have ended their weapons programs include Sweden (1970), Switzerland and Taiwan (1988), and Argentina and Brazil (1994).

THE NEW YORK TIMES

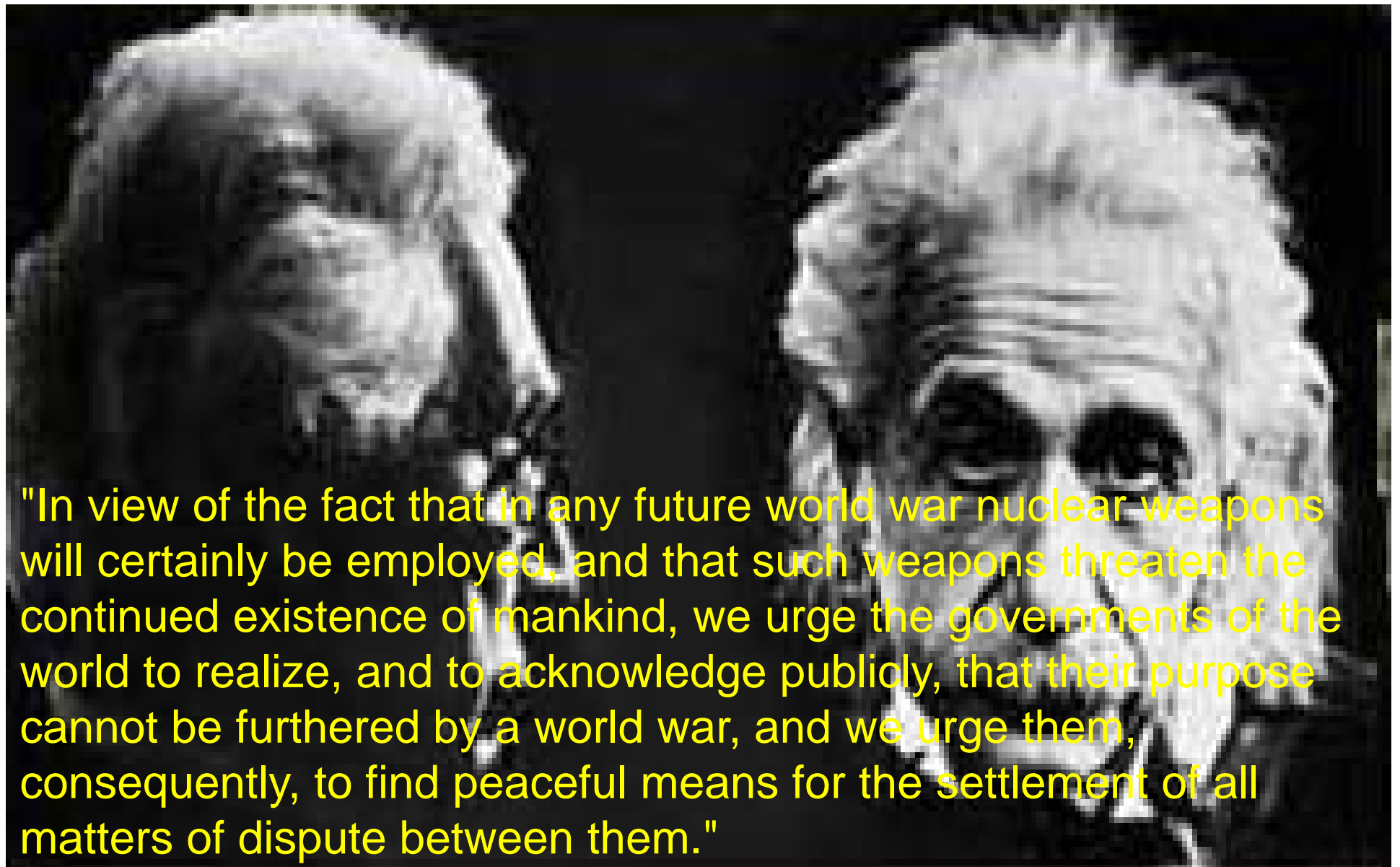
Germany' V2 missile program



Proliferation network of ballistic missiles after WW 2



From the Russel-Einstein Manifesto 1955 to the Pugwash movement 1957



"In view of the fact that in any future world war nuclear weapons will certainly be employed, and that such weapons threaten the continued existence of mankind, we urge the governments of the world to realize, and to acknowledge publicly, that their purpose cannot be furthered by a world war, and we urge them, consequently, to find peaceful means for the settlement of all matters of dispute between them."

Göttingen Manifesto of 18 nuclear scientists (April 12, 1957)

“The undersigned nuclear researchers are deeply concerned with the plans to equip the Bundeswehr with nuclear weapons. ...

- 1) Tactical nuclear weapons have the same destructive effect as normal atomic bombs.
- 2) There is no natural limit for the development of life-threatening effects of strategic nuclear weapons. Today a tactical nuclear weapon can destroy a small city, and a hydrogen bomb can render an entire region such as the Ruhr Valley uninhabitable.”.....

“Our profession, i.e. pure science and its application, through which we bring many young people into our fold, leaves us with the responsibility for the potential effects of these actions. We believe that a small country such as West Germany is best protected, and world peace most assisted when nuclear weapons of any type are banned. In any case, none of the undersigned are prepared to **participate in the creation, testing or deployment of any type of nuclear weapon.** At the same time we feel it is extremely important that we continue to work together on the peaceful development of nuclear energy.”



Fritz Bopp



Max Born



Rudolf Fleischmann



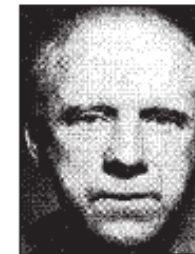
Walther Gerlach



Otto Hahn



Otto Haxel



Werner Heisenberg



Hans Kopfermann



Max von Laue



Heinz Maier-Leibnitz



Josef Mattauch



Friedrich-Adolf Paneth



Wolfgang Pauli



Wolfgang Riezler



Fritz Straßmann



Wilhelm Walcher



C. F. von Weizsäcker



Karl Wirtz

Scientists movement against nuclear arms



9,000 Scientists of 43 Lands Ask Nuclear Bomb Tests Be Stopped

Petition for International Accord Given U. N. Chief
by Linus Pauling

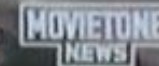
By THOMAS J. HAMILTON
Special to The New York Times.

UNITED NATIONS, N. Y.,
Jan. 13—More than 9,000 scientists from forty-three countries joined today in urging immedi-

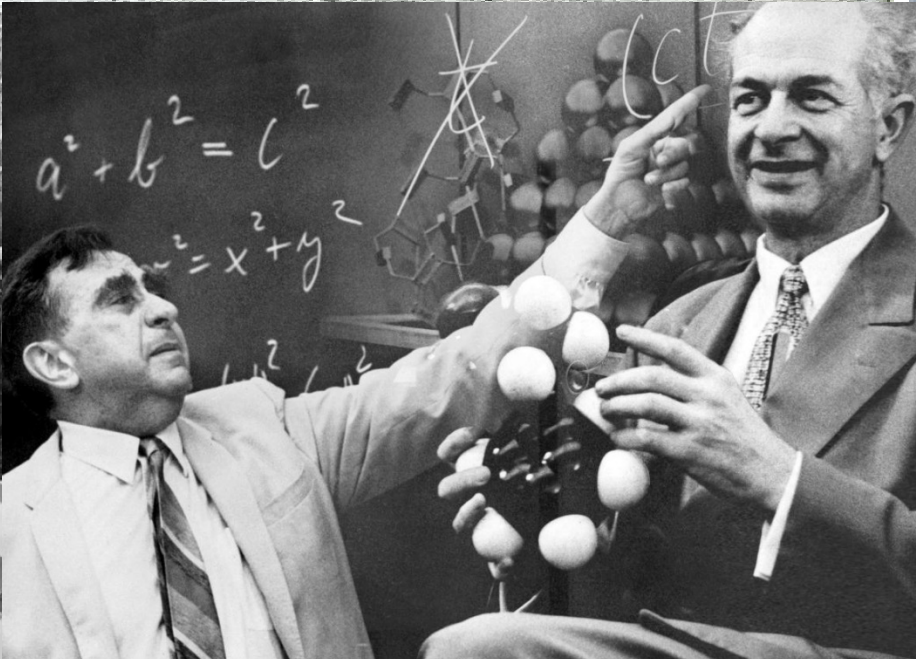


HISTORIC SIGNING OF ATOM TEST BAN TREATY

Supervised by LOUIS TETUNIC



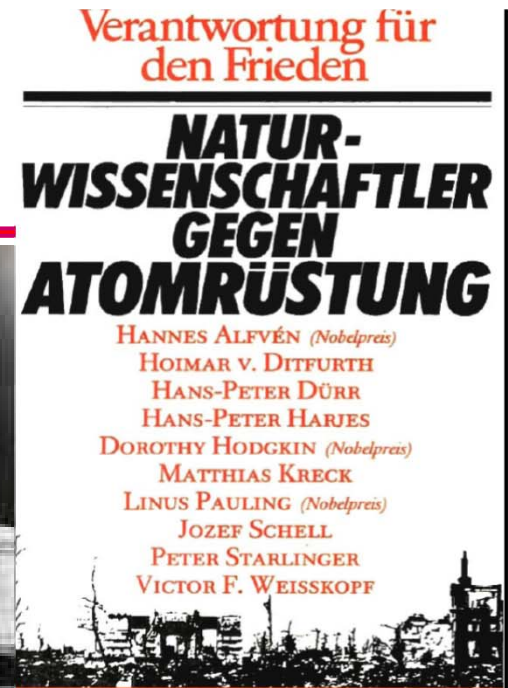
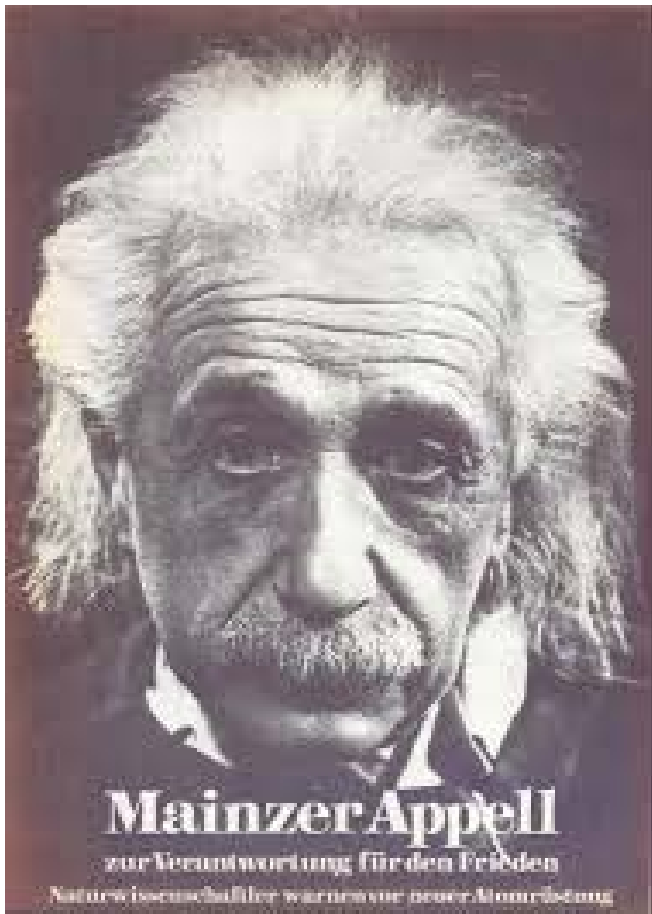
Narrated by PHIL TONKEN



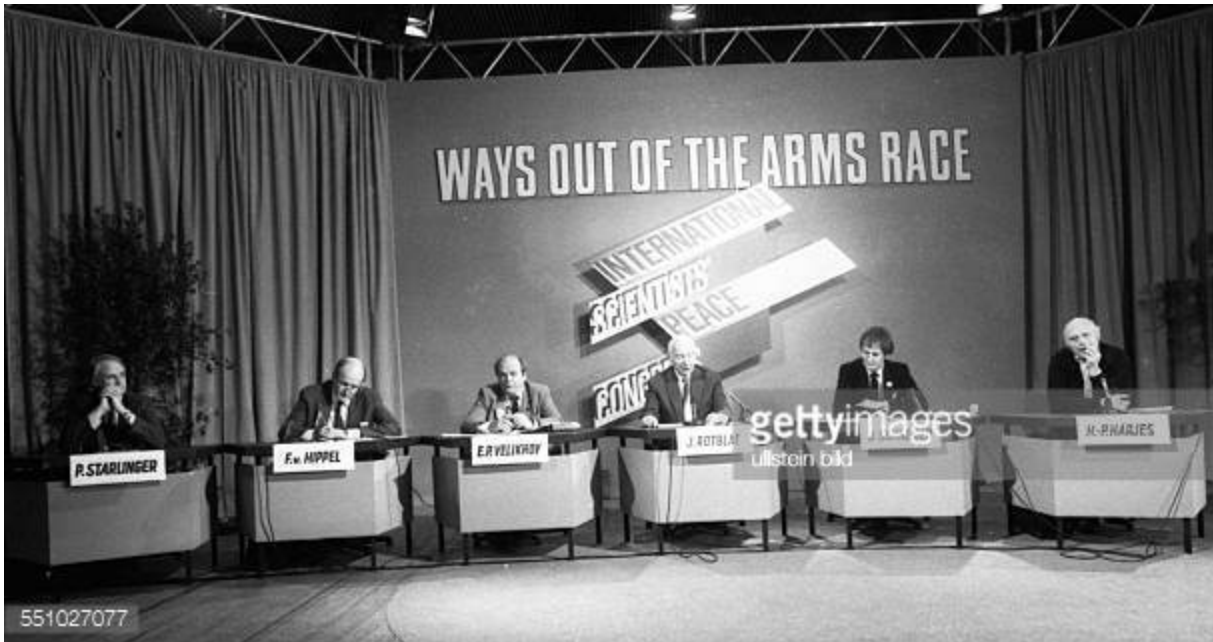
Missile debate and peace movements of the 1980s



Scientists for Peace Mainz 1983, Göttingen 1984



Ways Out of the Arms Race Hamburg 1986



551027077



551027073

Schriftenreihe Wissenschaft und Frieden

Wege aus dem Wettrüsten



Protokolle zum I. internationalen
Naturwissenschaftler-Friedenskongreß
Hamburg, November 1986

8

Jürgen Altmann, Jürgen Scheffran

Zur SDI-Debatte in den USA

Eindrücke von einer Reise

DIE ZEIT

Nur bei schönem Wetter

Von Horst Rademacher

DIE ZEIT 27/1985, 28. Juni 1985

In an open letter to Chancellor Helmut Kohl 350 German scientists declare to abstain from collaboration in the Strategic Defense Initiative (SDI)

(July 3, 1985).

Los Angeles Times | ARTICLE COLLECTIONS

Cloudy Day Could Sink 'Star Wars,' Scientist Cautions

May 28, 1985 | LEE DYE | Times Science Writer

Ground-based lasers designed to knock out Soviet ballistic missiles during a nuclear attack would be so vulnerable to atmospheric interference that they could not be used on a cloudy day, the chief scientist for the "Star Wars" defense program said Monday.

Gerold Yonas of the Defense Department's Strategic Defense Initiative Organization told several hundred scientists during a Los Angeles symposium that ground-based lasers could compensate for mild atmospheric conditions. But when asked by a member of the audience how lasers could offset the kind of distortion that would be caused by a heavy cloud layer, Yonas responded:

"A ground-based laser cannot operate with cloud cover."

Area citizens protest SDI

By Ben Stanger

Scientists and students from MIT, Harvard and Tufts said "No to 'Star Wars'" at a demonstration Saturday aimed at changing the course of President Reagan's summit with Soviet leader Mikhail S. Gorbachev in Geneva today.

Cabinet officials have recently counselled Reagan against sacrificing the "Star Wars" defensive research program at the summit.

Charlie Schueler, aide to Sen. John F. Kerry (D-Mass), read a letter from the Senator to the protesters at the rally:

"There is little in his record to indicate that Ronald Reagan will seek any meaningful reduction in nuclear arsenals in next week's meeting with Mr. Gorbachev. . . . The eloquent pledge by scientists not to participate in Star Wars projects . . . should awaken this administration to the notion that the people of this country will not accept weapons in outer space," the letter stated.

Boston City Council member David Scondras said that MIT students should stand up for themselves and refuse to get involved in "Star Wars" research. "Don't accept a job doing research if it makes you sick. . . . Don't participate, and it won't happen."

The Strategic Defense Initiative (SDI) is destabilizing to the Reagan-Gorbachev summit because it will cause an escalation of the arms race, according to Gary Goldstein, associate professor of physics at Tufts.

To counter the 90 percent effectiveness of "Star Wars," the Soviet Union need only increase their missile stockpiles, Goldstein explained.

"It is not enough for college presidents to denounce and then allow SDI research on their campuses," he concluded.

Speakers consider SDI's impact on universities

Undergraduate Association President Bryan Moser '87 called

on the Institute to clarify its stance on SDI because of potential political manipulation of MIT.

Rich Cowan G outlined MIT's historical ties with the military, which have been strong since World War II. Cowan said over (Please turn to page 11)

other than attendance, paying of dues or related issues.

The GSC members present voted against this, on the grounds that it might be necessary for an activity to protect itself from takeover by outsiders.

The MIT Black Students' Union (BSU), for example, distinguishes between regular mem- (Please turn to page 13)



Tech photo by Sidhu Banerjee
Prof. Joseph Weizenbaum speaks at Saturday's SDI rally on the steps of the Student Center.

The Tech (MIT) Vol. 105, (50), Tuesday, November 19, 1985

Report to The American Physical Society of the study group on science and technology of directed energy weapons

APS Study Group Participants

N. Bloembergen, *Co-chair*

Harvard University, Cambridge, Massachusetts 02138

C. K. N. Patel, *Co-chair*

AT&T Bell Laboratories, Murray Hill, New Jersey 07974

P. Avizonis

*Air Force Weapons Laboratory, Kirtland Air Force Base,
Albuquerque, New Mexico 87117*

R. G. Clem

Sandia National Laboratory, Albuquerque, New Mexico 87185

A. Hertzberg

University of Washington, Seattle, Washington 98195

T. H. Johnson

U.S. Military Academy, West Point, New York 10996

T. Marshall

Columbia University, New York, New York 10027

R. B. Miller

Sandia National Laboratory, Albuquerque, New Mexico 87185

E. E. Salpeter

Cornell University, Ithaca, New York 14853

A. M. Sessler

Lawrence Berkeley Laboratory, Berkeley, California 94720

J. D. Sullivan

University of Illinois, Urbana, Illinois 61801

J. C. Wyant

University of Arizona, Tucson, Arizona 85721

A. Yariv

California Institute of Technology, Pasadena, California 91125

R. N. Zare

Stanford University, Stanford, California 94305

A. J. Glass (*Principal Consultant*)

KMS Fusion, Ann Arbor, Michigan 48106

L. C. Hebel, *Executive Officer*

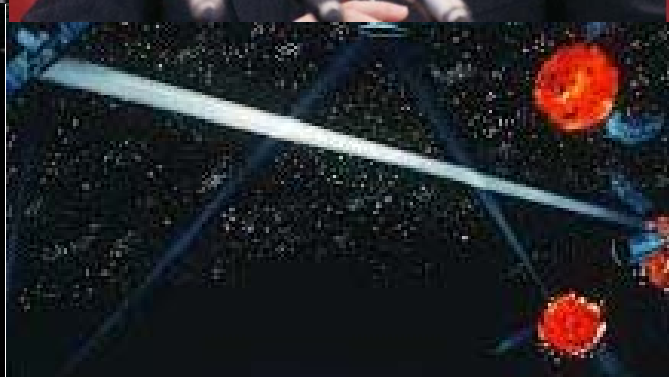
Xerox PARC, Palo Alto, California 94304



The report concludes... that the amount of progress in directed energy weapons—which include intense lasers and energetic particle beams—is too little at present to judge the ultimate technical feasibility of such weapons in an overall SDI system.

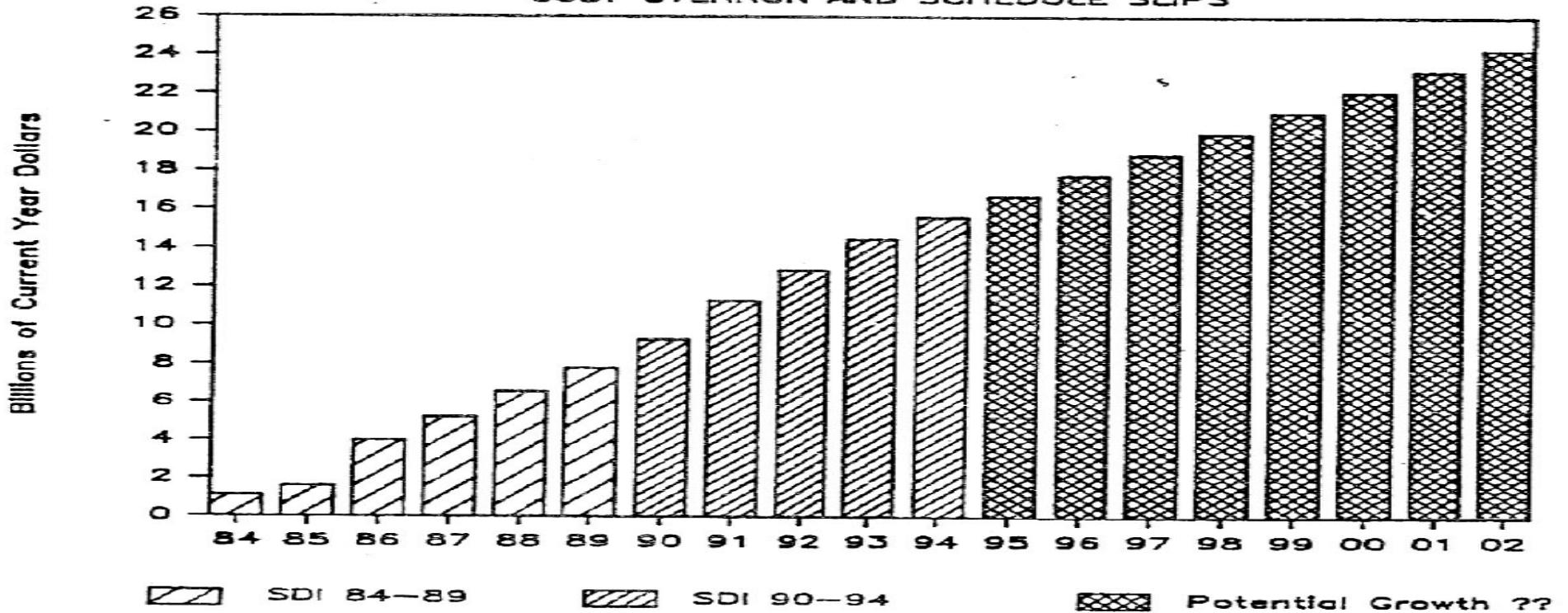
That makes questionable what panel member Jeremiah Sullivan of the University of Illinois termed "the general view, especially from SDIO, that directed energy weapons are the long-term hope.... The justification for early deployment of kinetic energy weapons cannot be the idea that [the more complex] directed energy weapons will come through in the long term."

Reagan and Gorbachev: Missile defense or nuclear abolition?



Strategic Defense vs. Nuclear Disarmament

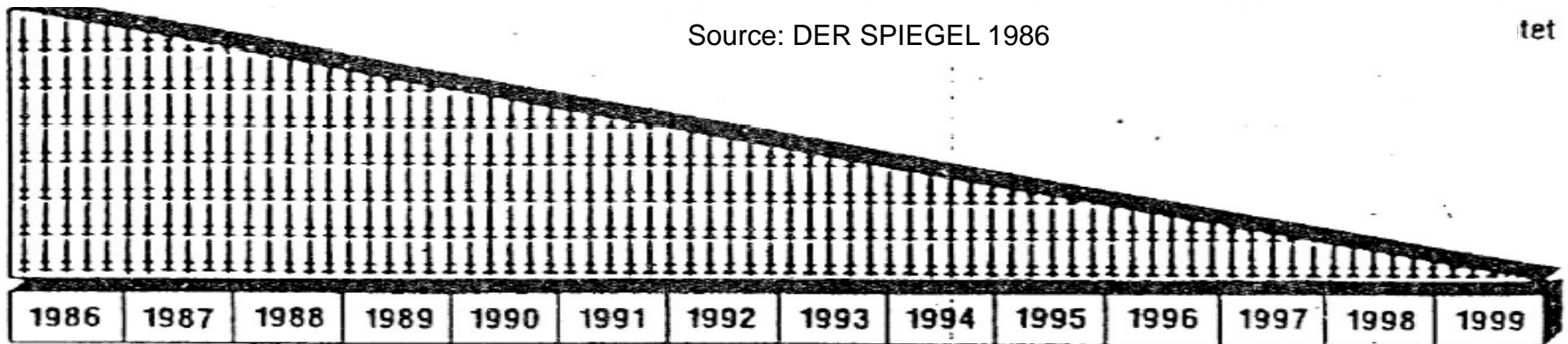
PESSIMISTIC SDI UNCERTAINTIES COST OVERRUN AND SCHEDULE SLIPS



Free the world of nuclear weapons: What Gorbachev offers if Reagan gives up SDI

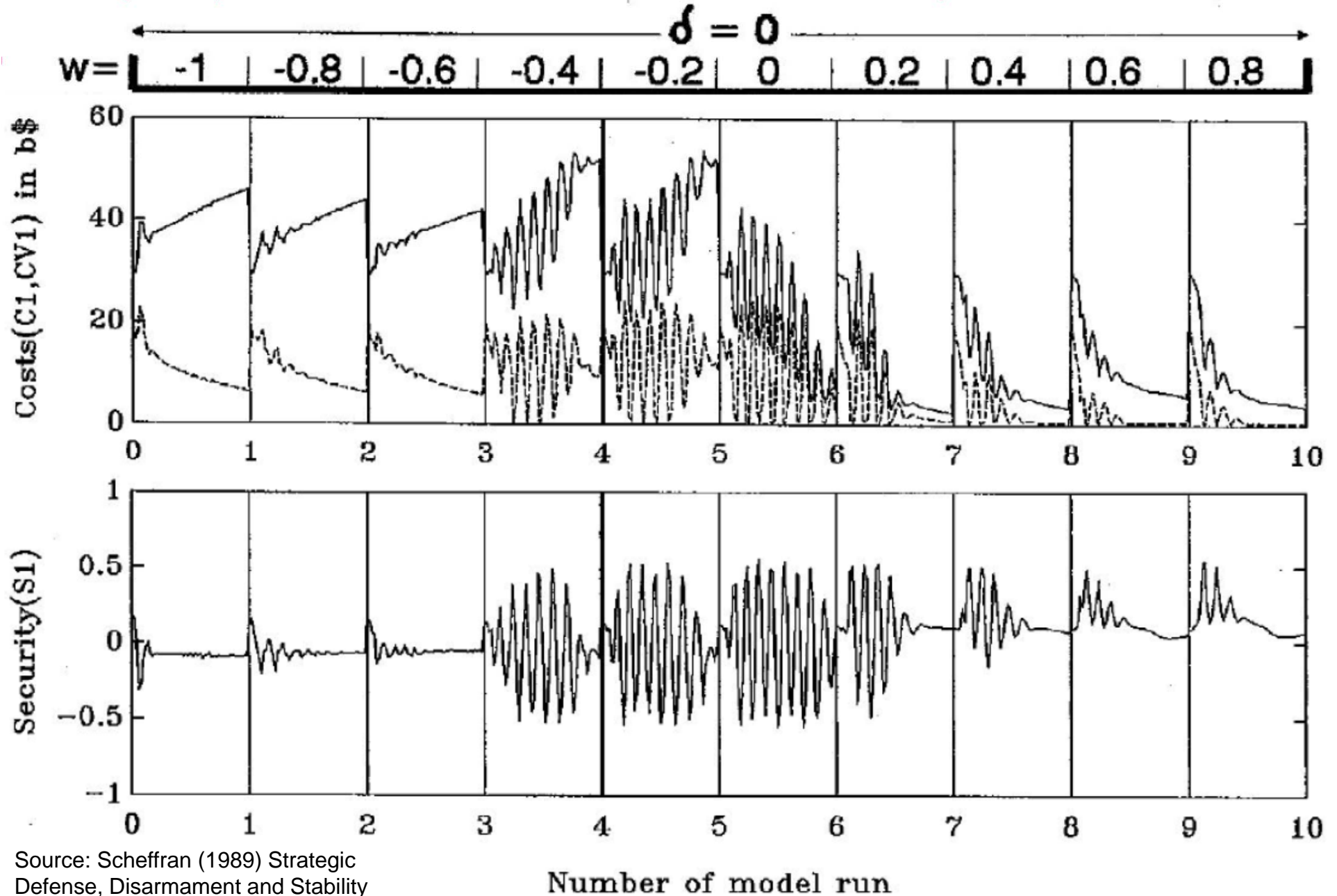
Source: DER SPIEGEL 1986

tet



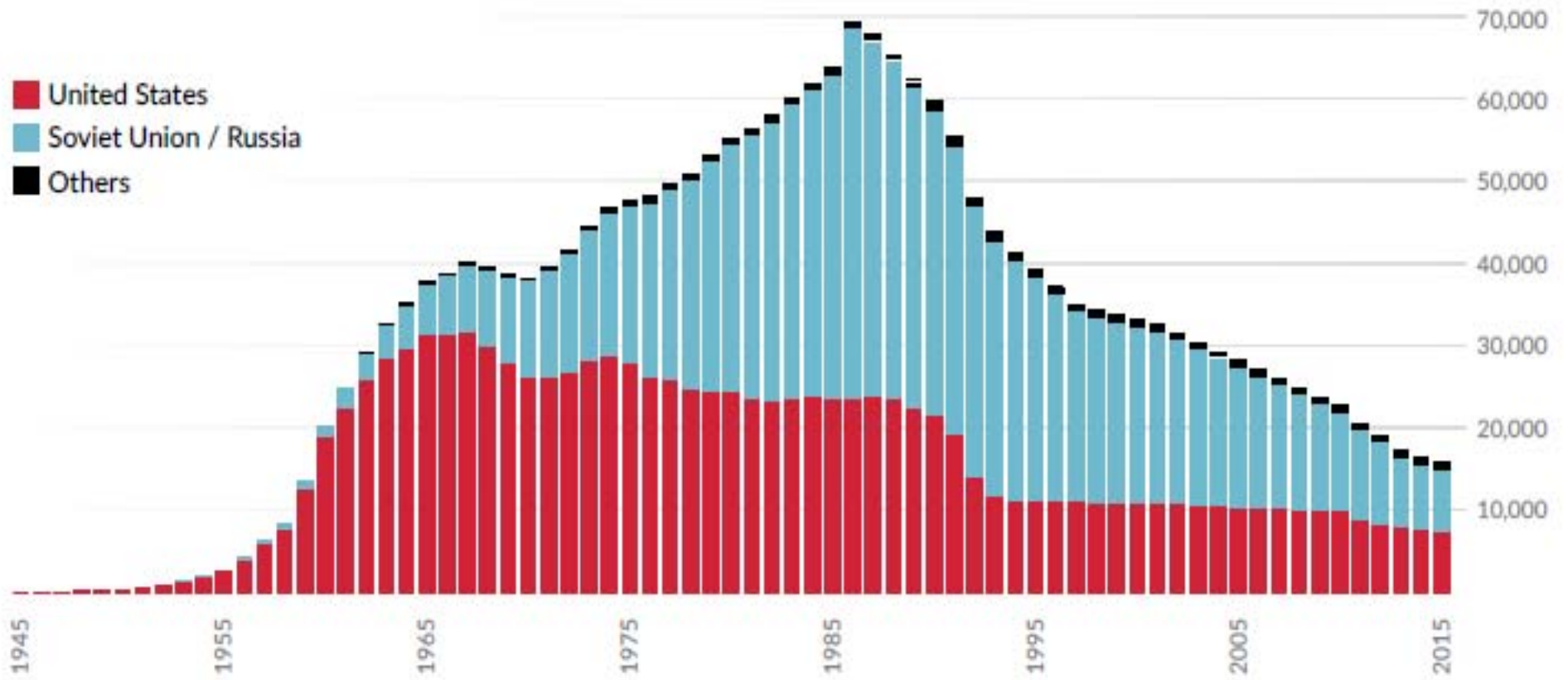
Transition & chaos in nuclear arms race: From armament to disarmament

Perception parameter $w = -1$ worst case, $w=1$ best case)



Source: Scheffran (1989) Strategic Defense, Disarmament and Stability

Global nuclear arsenals



Source: Bulletin of Atomic Scientists

WORLD'S NUCLEAR ARSENALS

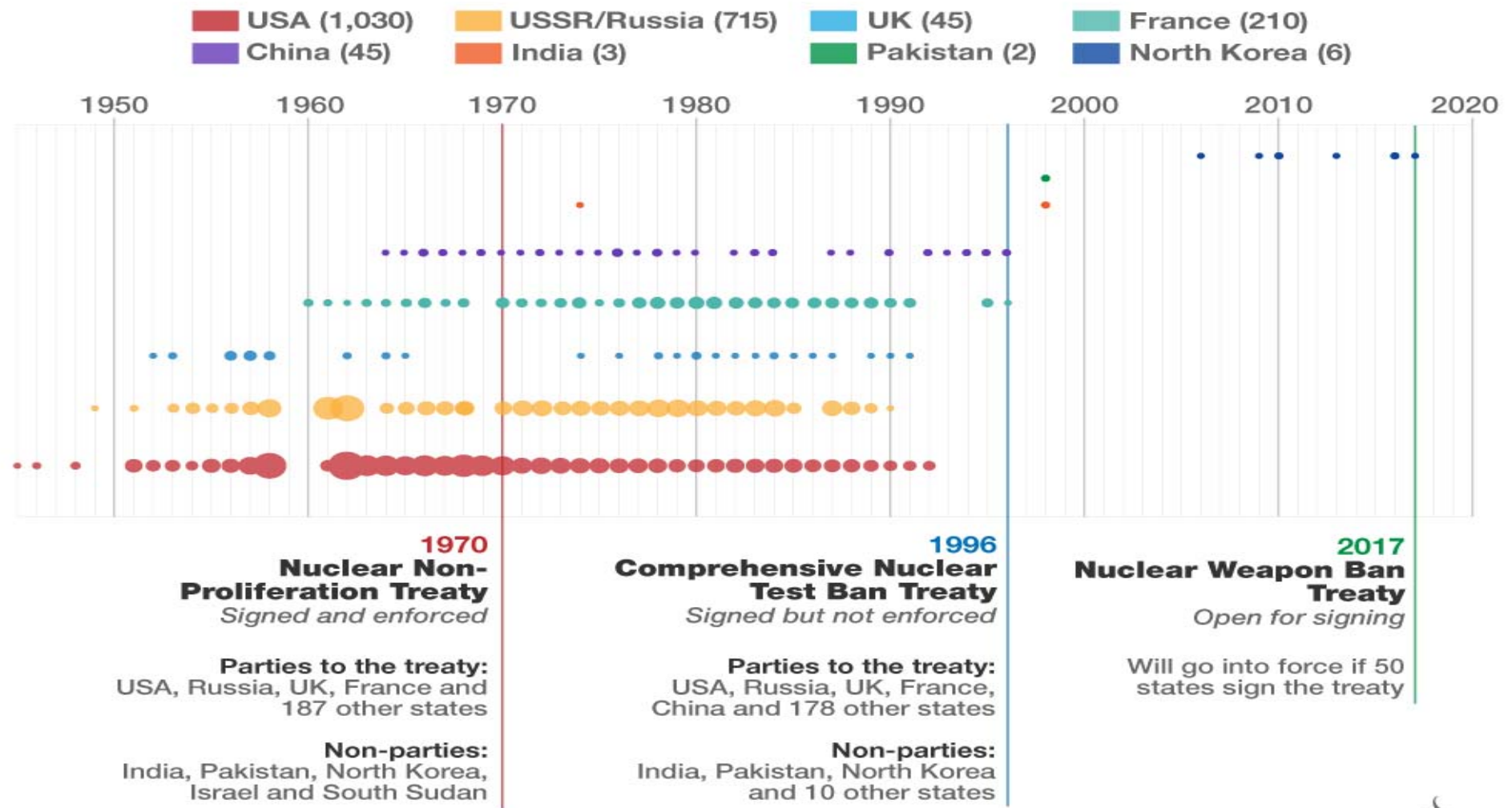


Sources: Hans M. Kristensen, Robert S. Norris, and U.S. Department of State. Updated: January 19, 2017.

ARMS CONTROL ASSOCIATION

A history of nuclear tests and disarmament treaties

Since the first nuclear explosion in July 16, 1945, there have been a total of 2,056 tests conducted by eight nuclear-armed states.



Sources: Arms Control Association, UNODA, CTBTO



International Network of Engineers & Scientists Against Proliferation (INESAP)



Mülheim August 1993



Santa Barbara March 2001



Shanghai Dezember 2001



Hiroshima October 2004



Berlin October 2002

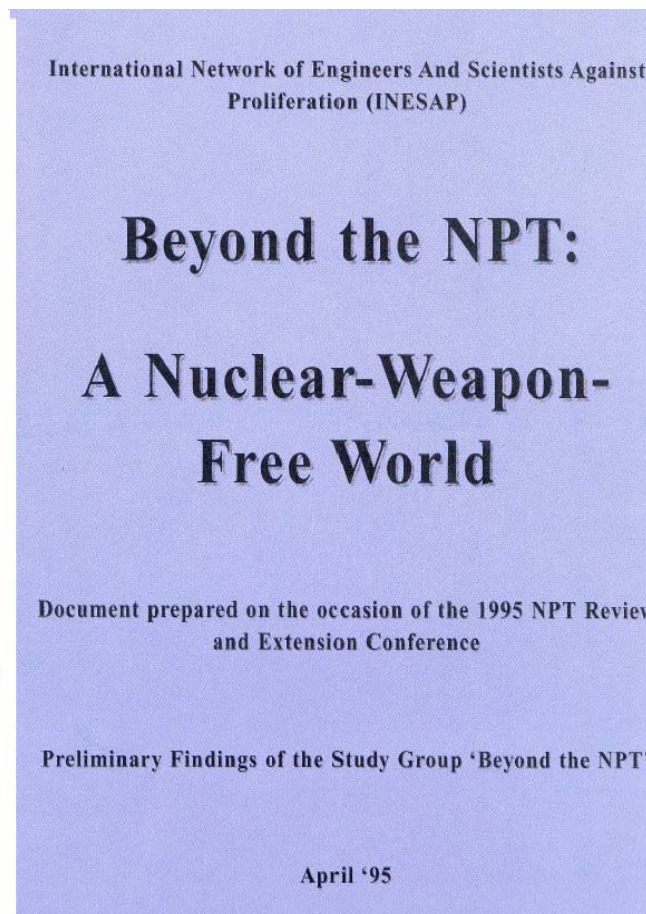
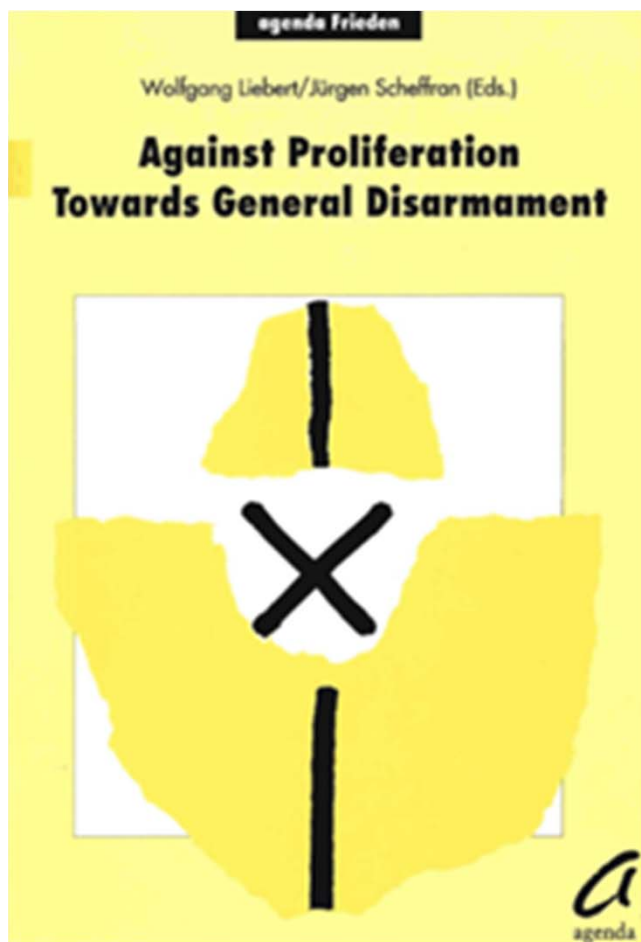


Berlin January 2003



Vienna May 2006

International Network of Engineers and Scientists Against Proliferation (INESAP)



Joseph Rotblat: Nuclear-weapon-free world and Nobel Peace Prize 1995



All nuclear weapon states should ... declare - in Treaty form - that they will never be the first to use nuclear weapons. This would open the way to the gradual, mutual reduction of nuclear arsenals, down to zero. It would also open the way for a Nuclear Weapons Convention. This would be universal - it would prohibit all possession of nuclear weapons.



The time has come to formulate guidelines for the ethical conduct of scientist, perhaps in the form of a voluntary Hippocratic Oath. This would be particularly valuable for young scientists when they embark on a scientific career....I appeal to my fellow scientists to remember their responsibility to humanity.



NPT Conference, New York 1995





ABOLITION 2000

GLOBAL NETWORK TO ELIMINATE NUCLEAR WEAPONS
NO NUKES, NO WAR

NETWORK BLOG



ABOLITION 2000 ON FACEBOOK



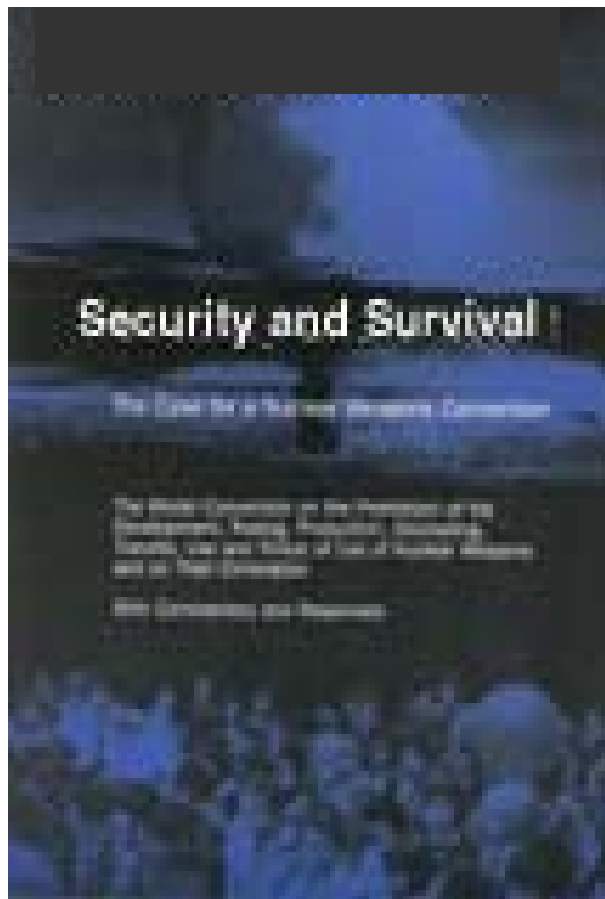
Abolition 2000 updated their cover photo.

Wednesday, March 15th, 2017 at 7:59am



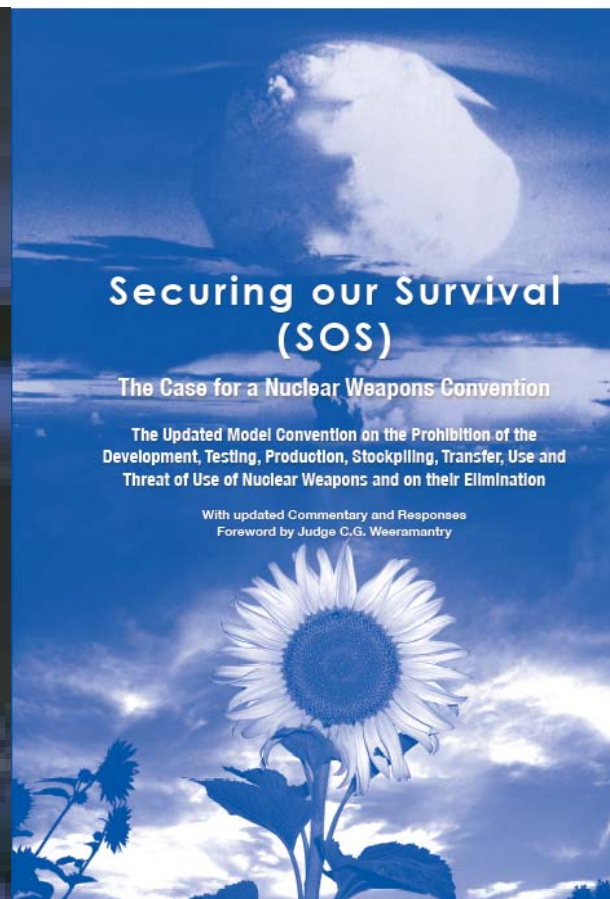
👍 2 View on Facebook

Model Nuclear Weapons Convention



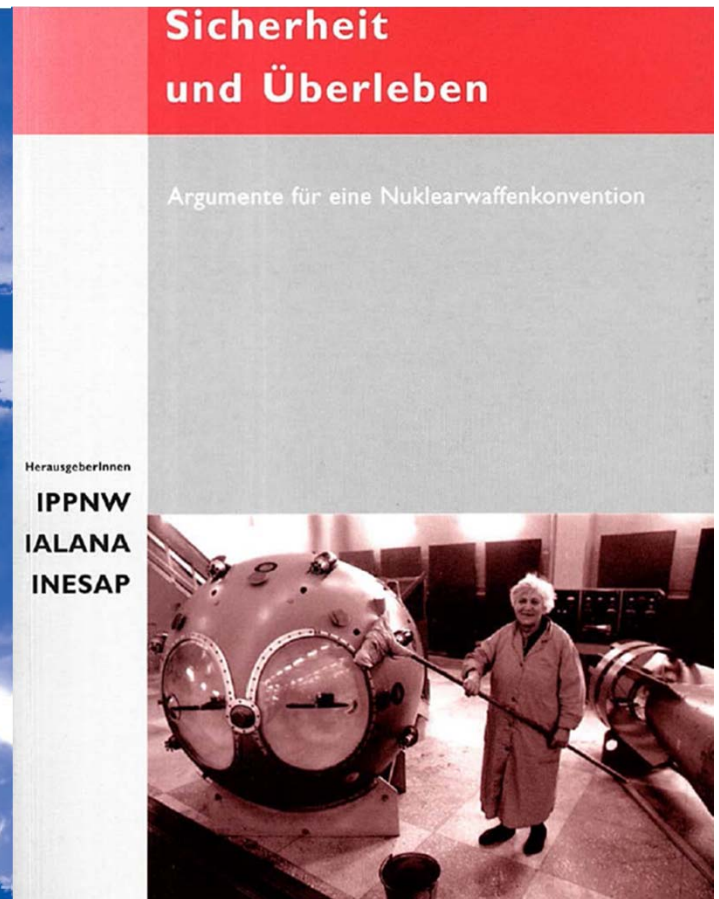
1997

Model NWC on the Prohibition of the Development, Testing, Production, Stockpiling, Transfer, Use & Threat of Use of Nuclear Weapons and on their Elimination



2007

Konvention über das Verbot von Entwicklung, Erprobung, Herstellung, Lagerung, Transfer, Einsatz und Drohung mit dem Einsatz von Kernwaffen und ihre Abschaffung



2000

Model Nuclear Weapons Convention

Model Nuclear Weapons Convention

Convention on the Prohibition of the
Development, Testing, Production,
Stockpiling, Transfer, Use and
Threat of Use of Nuclear Weapons
and on Their Elimination

ТИПОВАЯ КОНВЕНЦИЯ ПО ЯДЕРНОМУ ОРУЖИЮ

Конвенция о запрещении разработки, испытания, производства,
накопления запасов, передачи, применения и угрозы применения

核武器示范公约

关于禁止发展、试验、生产、储存、转让、
使用和威胁使用核武器及消除此种武器的公约

草 案

PROJET DE CONVENTION RELATIVE AUX ARMES NUCLÉAIRES

Projet de convention sur l'interdiction de la mise au point, de l'essai, de la fabrication,
du stockage, du transfert, de l'emploi ou de la menace d'emploi d'armes nucléaires,
et sur leur élimination

CONVENCIÓN TIPO SOBRE ARMAS NUCLEARES

Convención sobre la prohibición del desarrollo, los ensayos, la
producción, el almacenamiento, la transferencia, el empleo o la
amenaza del empleo de armas nucleares y sobre su eliminación

PROYECTO

الاتفاقية النموذجية للأسلحة النووية

اتفاقية حظر استحداث الأسلحة النووية
وتجريبها وإنتاجها وتخزينها ونقلها واستعمالها
والتهديد باستعمالها وإزالة تلك الأسلحة

UN Resolution on Nuclear Weapons Convention

(12. Dec. 1996)

Paragraph 3: "Underlines the unanimous conclusion of the Court that 'There exists an obligation to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control' ".

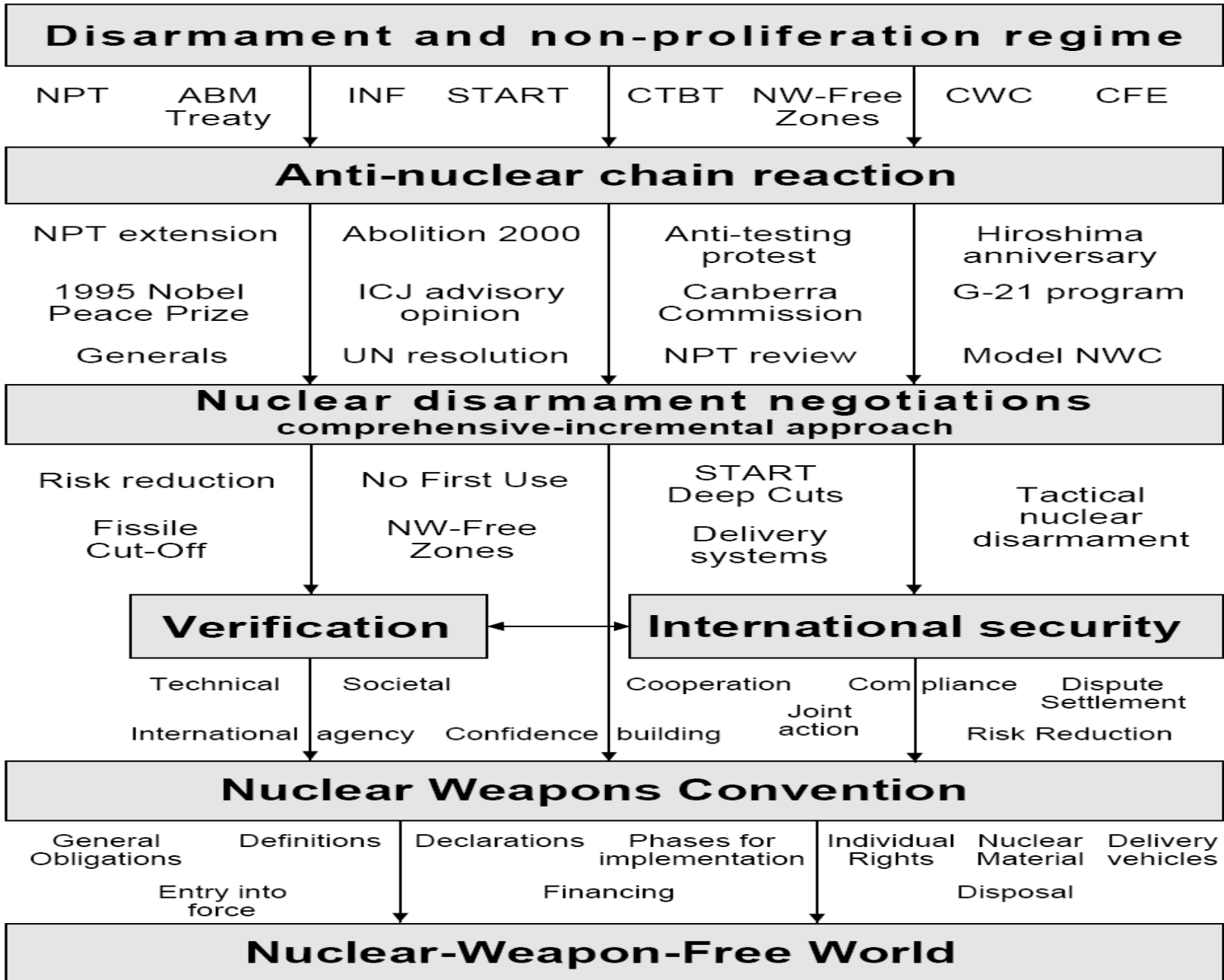
Paragraph 4: "Calls upon all States to fulfil that obligation immediately by commencing multilateral negotiations in 1997 leading to an early **conclusion of a nuclear weapons convention** prohibiting the development, production, testing, deployment, stockpiling, transfer, threat or use of nuclear weapons and providing for their elimination".

Yes: 115 States

No: 22

Abstentions: 32

Transformation into a Nuclear-Weapon-Free World



Model Nuclear Weapons Convention: Basic Obligations

Model Convention on the Prohibition of the Development, Testing, Production, Stockpiling, Transfer, Use and Threat of Use of Nuclear Weapons and on Their Elimination (1997/2007)

Negative Obligations

States Parties undertake never to

- use or threaten to use nuclear weapons
- engage in any military or other preparations to use nuclear weapons
- [research], develop, test, produce, otherwise acquire, deploy, stockpile, maintain, retain or transfer nuclear weapons or delivery vehicles
- produce, stockpile, retain, transfer, or use nuclear weapons grade fissionable or fusionable material (except medical, etc.)

Positive Obligations

States Parties undertake to

- Destroy nuclear weapons and destroy or convert facilities in the production, testing, and research of nuclear weapons as well as nuclear weapons delivery vehicles
- Participate in activities aimed at transparency and education for purposes of detecting and preventing prohibited activities
- Report violations of the Convention, cooperate with the implementing Agency, and enact domestic legislation for implementation.

Phases of the Model Nuclear Weapons Convention

Phase I [1 year]

- Each State Party would submit to the Agency plans for the implementation of the NWC
- All nuclear weapons and delivery vehicles would be de-alerted and disabled
- Targeting coordinates and navigational information for all nuclear weapons delivery vehicles shall be removed

Phase II [2 years]

- All warheads removed from delivery vehicles
- Weapons and delivery vehicles removed from deployment sites
- Agreements for preventive control negotiated

Phase III [5 years]

- All nuclear weapons would be dismantled
- All nuclear weapons delivery vehicles destroyed or converted
- All nuclear weapons would be destroyed except a fixed number of warheads in the stockpiles of Russia and the US, with proportional cuts by China, France and UK
- Similar provisions for other States known to possess nuclear weapons

Phase IV [10 years]

- More cuts in the number of nuclear weapons
- [All reactors using plutonium as fuel would be closed or converted]

Phase V [15 years]

- All nuclear weapons would be destroyed
- The powers and functions of the Agency would be reviewed and adjusted

International Launch

*Securing our Survival:
The Case for a Nuclear Weapons Convention*
and the
International Campaign to Abolish Nuclear Weapons
(ICAN)

Monday, April 30, 2007
1:15 – 2:45 pm
Plenary Room A, Austria Center

Sponsors:

International Physicians
for the Prevention
of Nuclear War (IPPNW)
International Network of Engineers and Scientists
Against Proliferation (INESAP)
International Association of Lawyers
Against Nuclear Arms (IALANA)

Co-Sponsor:

Government of Malaysia

Speakers:

Felicity Hill, ICAN
Ron McCoy, IPPNW
Jürgen Scheffran, INESAP
Carlos Vargas, Costa Rica
Alyn Ware, IALANA

Please join us on the opening day of the 2007 NPT PrepCom for the release of a new edition of *The Case for a Nuclear Weapons Convention* and for the launch of a new civil society campaign for nuclear abolition.



Securing our Survival (SOS) outlines the rationale for the comprehensive prohibition and elimination of nuclear weapons. The book, hot off the presses, contains an updated text of the Model Nuclear Weapons Convention, which demonstrates that nuclear disarmament is practical, verifiable, enforceable and achievable.

The International Campaign to Abolish Nuclear Weapons (ICAN), a new initiative of IPPNW, will generate political will for global nuclear disarmament through educating and engaging the public and policy makers and by highlighting the feasibility of nuclear abolition through a Nuclear Weapons Convention.

"The principal agenda item in our program for human survival in this 21st Century must be the elimination of nuclear weapons.... [E]liminating the bomb can only be achieved through a Convention subscribed to by all powers, nuclears and non-nuclears alike."
—Judge Weeramantry, former Vice-President of the International Court of Justice, in the foreword to *SOS*.



23 April 2007: ICAN launched in Australia



30 April 2007: ICAN launched in Vienna international at NPT Conference

TOWARDS A TREATY BANNING NUCLEAR WEAPONS

A Guide to Government Positions on a Nuclear Weapons Convention



International Campaign to Abolish Nuclear Weapons

The Case for a Nuclear Weapons Convention

The International Campaign to Abolish Nuclear Weapons (ICAN) is a new campaign of International Physicians for the Prevention of Nuclear War (IPPNW), a federation of medical professionals in 60 countries. The organisation received the Nobel Peace Prize in 1985 for uniting doctors across the Cold War divide to raise awareness of the threats posed by nuclear weapons. The physician group's prescription for survival was, and remains, the complete elimination of nuclear weapons.

ICAN focuses on the roots of the nuclear weapons problem – the continued possession of nuclear weapons by a small minority of countries, who risk their use by design, accident, miscalculation or by acts of extremists, and whose weapons are an incentive to others to also become nuclear armed.

ICAN aims to achieve a **Nuclear Weapons Convention** to ban the development, possession and use of nuclear weapons. A Model Nuclear Weapons Convention already exists.

What is a Nuclear Weapons Convention?

A Nuclear Weapons Convention (NWC) will be an international treaty signed by governments. It will be similar to other international treaties banning entire categories of weapons such as the Chemical Weapons Convention, the Biological Weapons Convention and the Landmines Convention.

No such treaty exists yet for nuclear weapons, but demands for one have increased in recent years, as have more general demands for complete nuclear disarmament. 125 of 181 governments voting in the 2006 UN General Assembly want negotiations to commence immediately. Vast majorities in public opinion polls want a nuclear weapon-free future. In a 1998 Angus Reid poll 93% of Canadians expressed support for a global ban on nuclear weapons.

The Nuclear Weapons Convention would be the implementation of the universal societal condemnation of nuclear weapons and all weapons of mass destruction. It would delegitimize nuclear weapons and support their prohibition. Its impact will therefore be deeper and more far-reaching than the treaty language itself. Such a treaty would reflect a broader social and political movement away from reliance on weapons of mass destruction and military solutions to conflicts, and would incorporate the desires and responsibilities of global civil society for a less militarized world.

A Nuclear Weapons Convention:

Defines terms in precise detail to establish thresholds and limits

Creates rules so that everybody understands what is prohibited and what is allowed

Establishes a schedule for sequenced steps to remove the threat of nuclear weapons by their dismantlement

Outlines patterns of behaviour and cooperation that will enhance the communication and transparency in implementing the treaty, and those that will arouse suspicion and sanctions

Establishes verification measures to make sure that no one is cheating.

Support for a Nuclear Weapons Convention



Support
146

Afghanistan	Grenada	Paraguay
Algeria	Guatemala	Peru
Angola	Guinea	Philippines
Antigua & Barbuda	Guinea-Bissau	Qatar
Argentina	Guyana	Rwanda
Austria	Haiti	Saint Kitts & Nevis
Azerbaijan	Holy See	Saint Lucia
Bahamas	Honduras	Saint Vincent & Gren.
Bahrain	India	Samoa
Bangladesh	Indonesia	San Marino
Barbados	Iran	São Tomé & Príncipe
Belize	Iraq	Saudi Arabia
Benin	Ireland*	Senegal
Bhutan	Jamaica	Serbia
Bolivia	Jordan	Seychelles
Bosnia & Herzegovina	Kazakhstan	Sierra Leone
Botswana	Kenya	Singapore
Brazil	Kiribati	Solomon Islands
Brunei	Kuwait	Somalia
Burkina Faso	Laos	South Africa
Burma	Lebanon	South Sudan
Burundi	Lesotho	Sri Lanka
Cambodia	Liberia	Sudan
Cameroon	Libya	Suriname
Cape Verde	Liechtenstein	Swaziland
Central African Rep.	Madagascar	Sweden*
Chad	Malawi	Switzerland
Chile	Malaysia	Syria
China*	Maldives	Tajikistan
Colombia	Mali	Tanzania
Comoros	Malta	Thailand
Congo	Mauritania	Timor-Leste
Costa Rica	Mauritius	Togo
Cote d'Ivoire	Mexico	Tonga
Cuba	Mongolia	Trinidad & Tobago
Dem. Rep. of Congo	Morocco	Tunisia
Djibouti	Mozambique	Turkmenistan
Dominica	Namibia	Tuvalu
Dominican Republic	Nepal	Uganda
Ecuador	New Zealand*	Ukraine
Egypt	Nicaragua	United Arab Emirates
El Salvador	Niger	Uruguay
Equatorial Guinea	Nigeria	Vanuatu
Eritrea	North Korea	Venezuela
Ethiopia	Norway	Vietnam
Fiji	Oman	Yemen
Gabon	Pakistan	Zambia
Gambia	Panama	Zimbabwe
Ghana	Papua New Guinea	

* The support expressed by these nations is qualified. See position descriptions.



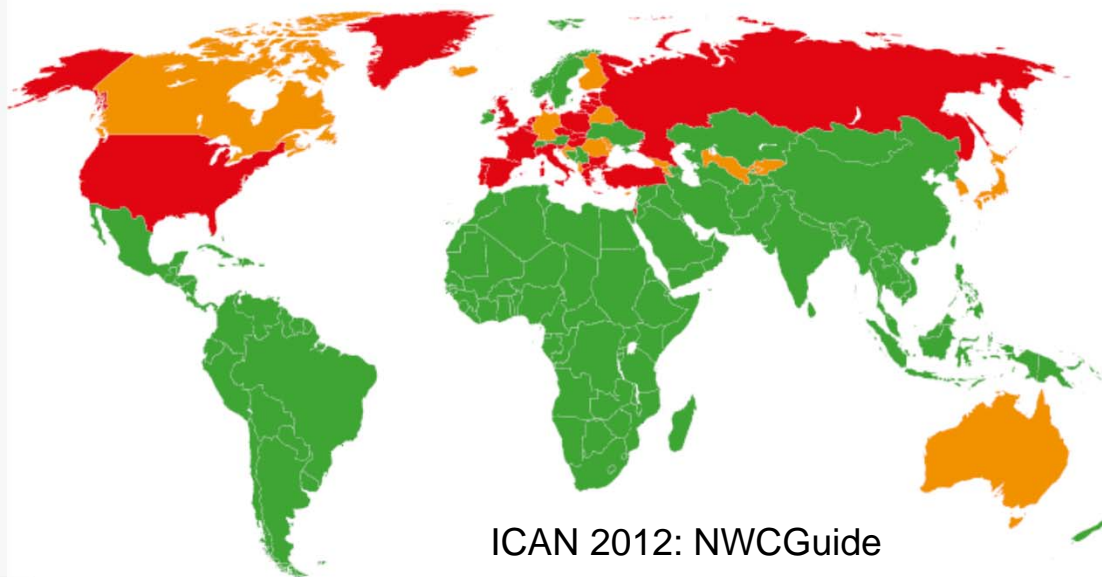
On the fence
22

Andorra	Germany	Moldova
Armenia	Georgia	Montenegro
Australia	Iceland	Nauru
Belarus	Japan	Romania
Canada	Kyrgyzstan	South Korea
Croatia	Macedonia	Uzbekistan
Cyprus	Marshall Islands	
Finland	Micronesia	



Don't support
26

Albania	Israel	Portugal
Belgium	Italy	Russia
Bulgaria	Latvia	Slovakia
Czech Republic	Lithuania	Slovenia
Denmark	Luxembourg	Spain
Estonia	Monaco	Turkey
France	Netherlands	United Kingdom
Greece	Palau	United States
Hungary	Poland	



ICAN 2012: NWCGuide

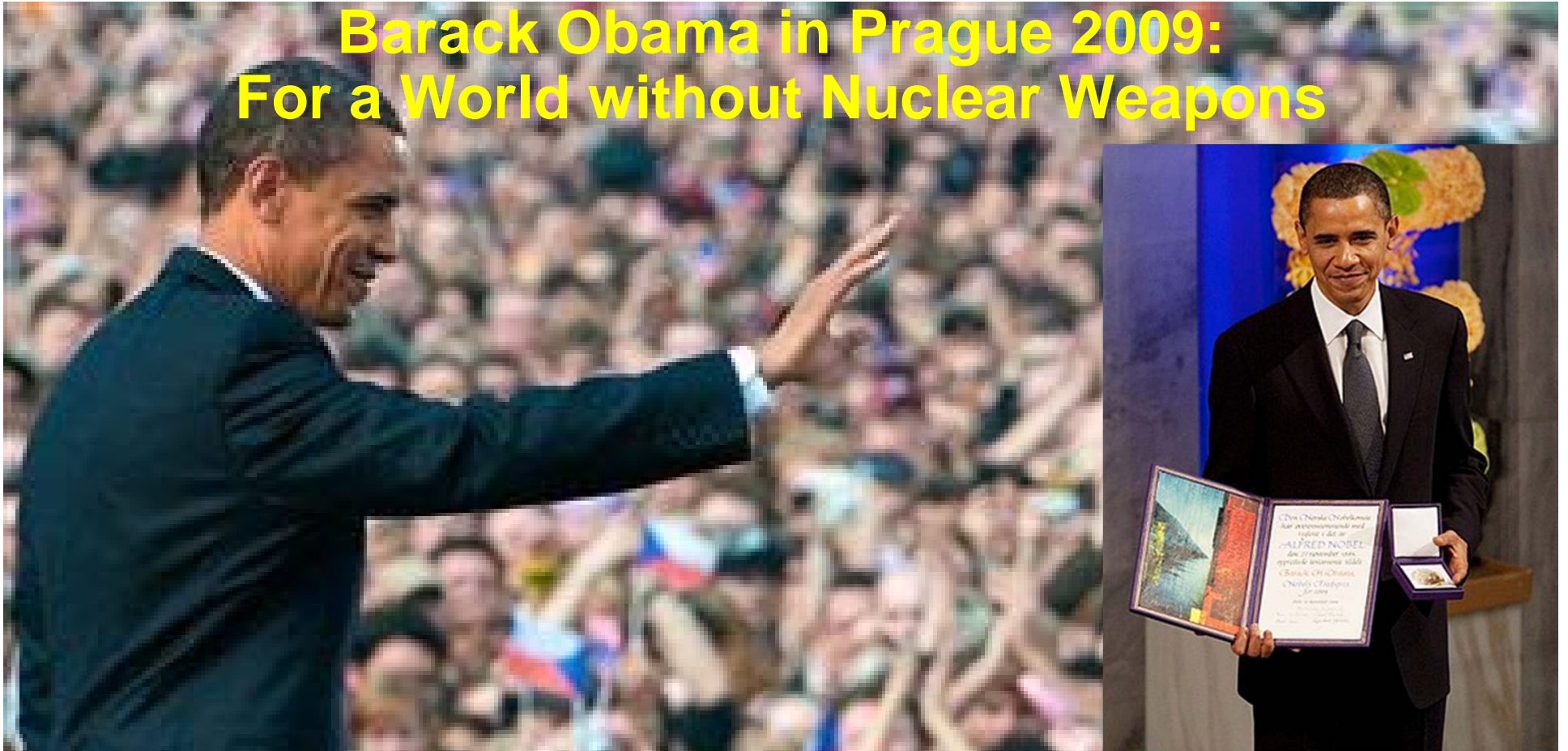
UN Secretary General plan to rid the world of nuclear weapons



My own five-point plan ... begins with a call for the NPT parties to pursue negotiations in good faith - as required by the treaty - on nuclear disarmament, either through a **new convention or through a series of mutually reinforcing instruments** backed by a credible system of verification. ...

Ban Ki-moon, 3 August 2009 (www.un.org/sg/articleFull.asp?TID=105&Type=Op-Ed)

Barack Obama in Prague 2009: For a World without Nuclear Weapons



“As the only nuclear power to have used a nuclear weapon, the United States has a moral responsibility to act. We cannot succeed in this endeavor alone, but we can lead it; we can start it. So today, I state clearly and with conviction America's commitment to seek the peace and security of a world without nuclear weapons. This goal will not be reached quickly -- perhaps not in my lifetime. It will take patience and persistence.”



NUCLEAR **BAN** TREATY NEGOTIATIONS

UNITED NATIONS, NEW YORK
27-31 MARCH 2017
15 JUNE - 7 JULY 2017

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NEGOTIATIONS



Blog: Countdown to nuclear ban negotiations

UN negotiations to outlaw nuclear weapons will begin on 27 March 2017. This blog will keep you informed of key developments in the lead-up



<https://futureoflife.org/nuclear-open-letter/>

Media embargoed until 1PM ET Monday March 27

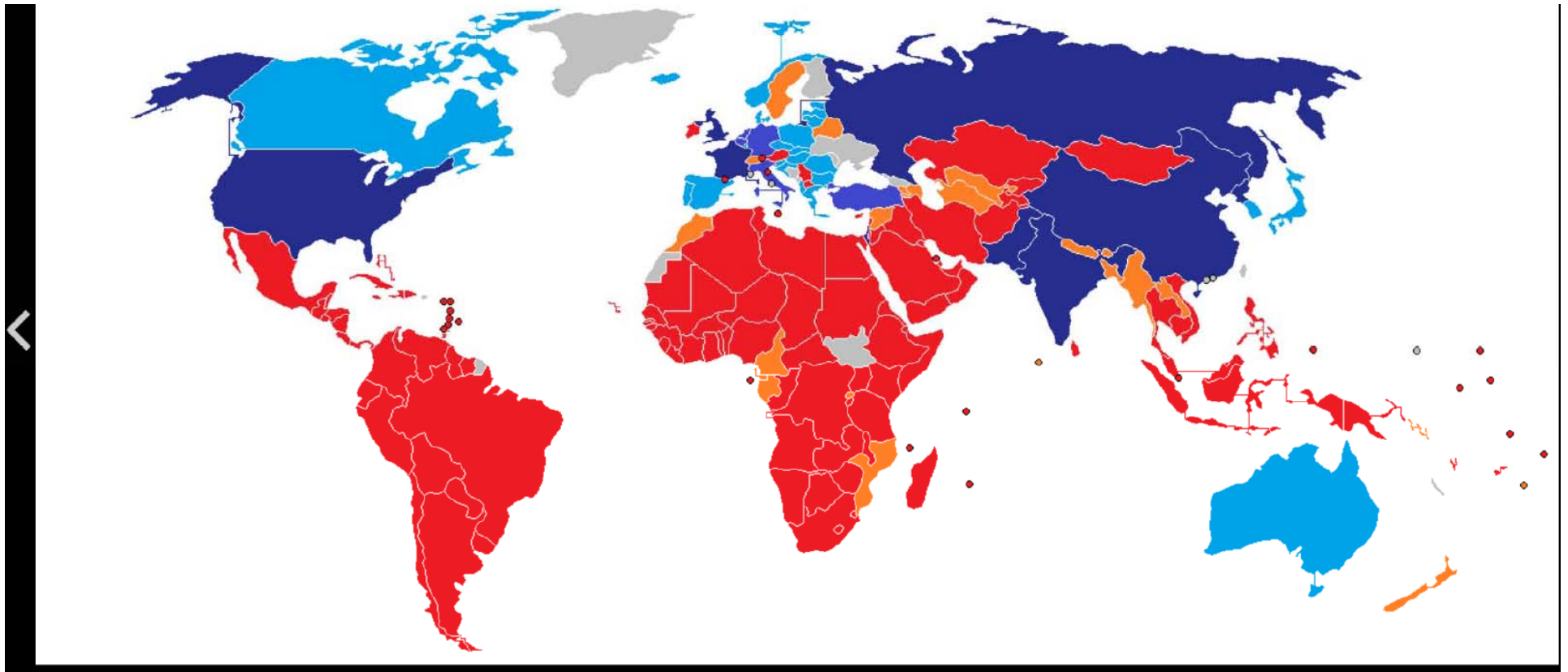
An Open Letter from Scientists in Support of the UN Nuclear Weapons Negotiations

Nuclear arms are the only weapons of mass destruction not yet prohibited by an international convention, even though they are the most destructive and indiscriminate weapons ever created. We scientists bear a special responsibility for nuclear weapons, since it was scientists who invented them and discovered that their effects are even more horrific than first thought. Individual explosions can obliterate cities, radioactive fallout can contaminate regions, and a high-altitude electromagnetic pulse may cause mayhem by frying electrical grids and electronics across a continent. The most horrible hazard is a nuclear-induced winter, in which the fires and smoke from as few as a thousand detonations might darken the atmosphere enough to trigger a global mini ice age with year-round winter-like conditions. This could cause a complete collapse of the global food system and apocalyptic unrest, potentially killing most people on Earth – even if the nuclear war involved only a small fraction of the roughly 14,000 nuclear weapons that today's nine nuclear powers control. As Ronald Reagan said: *"A nuclear war cannot be won and must never be fought."*

Unfortunately, such a war is more likely than one may hope, because it can start by mistake, miscalculation or terrorist provocation. There is a steady stream of accidents and false alarms that could trigger all-out war, and relying on never-ending luck is not a sustainable strategy. Many nuclear powers have larger nuclear arsenals than needed for deterrence, yet prioritize making them more lethal over reducing them and the risk that they get used.

But there is also cause for optimism. On March 27 2017, an unprecedented process begins at the United Nations: most of the world's nations convene to negotiate a ban on nuclear arms, to stigmatize them like biological and chemical weapons, with the ultimate goal of a world free of these weapons of mass destruction. We support this, and urge our national governments to do the same, because nuclear weapons threaten not merely those who have them, but all people on Earth.

Supporters for the Ban Treaty



■ Unterstützen den Vertrag formell[4] ■ Stimmen für den Vertrag[4] ■ Keine Befürwortung, besitzen Nuklearwaffenprogramm ■ Keine Befürwortung, Nukleare Teilhabe ■ Keine Befürwortung, Teil einer nuklearen Allianz

 Weitere Einzelheiten



The United Nations prohibits nuclear weapons

July 7, 2017

After a decade-long effort by the International Campaign to Abolish Nuclear Weapons (ICAN), and 72 years after their invention, today states at the United Nations formally adopted a **treaty** which categorically prohibits nuclear weapons.

G20 Summit in Hamburg, July 7/8, 2017

G20 GERMANY 2017
HAMBURG



ICAN receives 2017 Nobel Peace Prize



Elements of the Ban Treaty

Article 1 contains prohibitions against the development, testing, production, stockpiling, stationing, transfer, use and threat of use of nuclear weapons, as well as against assistance and encouragement to the prohibited activities, and direct or indirect "control over nuclear weapons or other nuclear explosive devices".

Article 2 requires each party to declare whether it had nuclear weapons of their own or deployed on its territory, including the elimination or conversion of related facilities.

Article 3 requires parties that do not possess nuclear weapons to maintain their existing IAEA safeguards and, to accept safeguards based on the model for non-nuclear-weapon states under the NPT.

Elements of the Ban Treaty

Article 4: general procedures for negotiations with an individual nuclear armed state becoming party to the treaty, including time limits and responsibilities. If the state has eliminated its nuclear weapons before becoming a party to the treaty, an unspecified "competent international authority" will verify that elimination, and the state must also conclude a safeguards agreement with the IAEA to provide credible assurance that it has not diverted nuclear material and has no undeclared nuclear material or activities.

If the state has not yet destroyed its arsenal, it must negotiate with "competent international authority" a time-bound plan for verified and irreversible elimination of its nuclear weapons programme, which will submit it to the next meeting of signing states or to next review conference, whichever comes first.

Article 5: national implementation.

Article 6: environmental remediation and assistance for victims of the use and testing of nuclear weapons.

Elements of the Ban Treaty

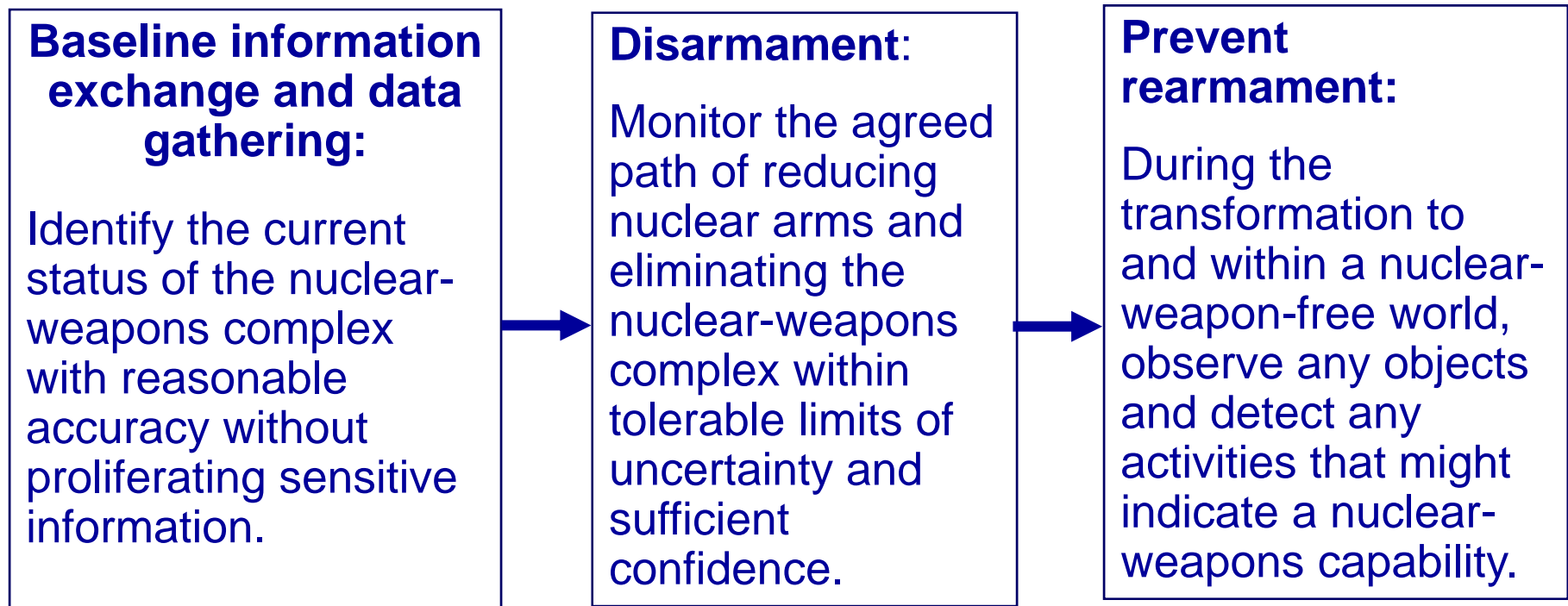
Article 7: states should assist each other to these purposes, with special responsibility of the nuclear powers; all state parties shall cooperate

Article 8: fixes meetings of states parties,
Article 9: costs are shared by the states.

Articles 10–12: possibility of amendments, the settlement of disputes and the "goal of universal adherence of all States to the Treaty".

Articles 13–15: Treaty was open for signature from 20 September 2017 at the UN headquarters in New York and "shall enter into force 90 days after the fiftieth instrument of ratification, acceptance, approval or accession".

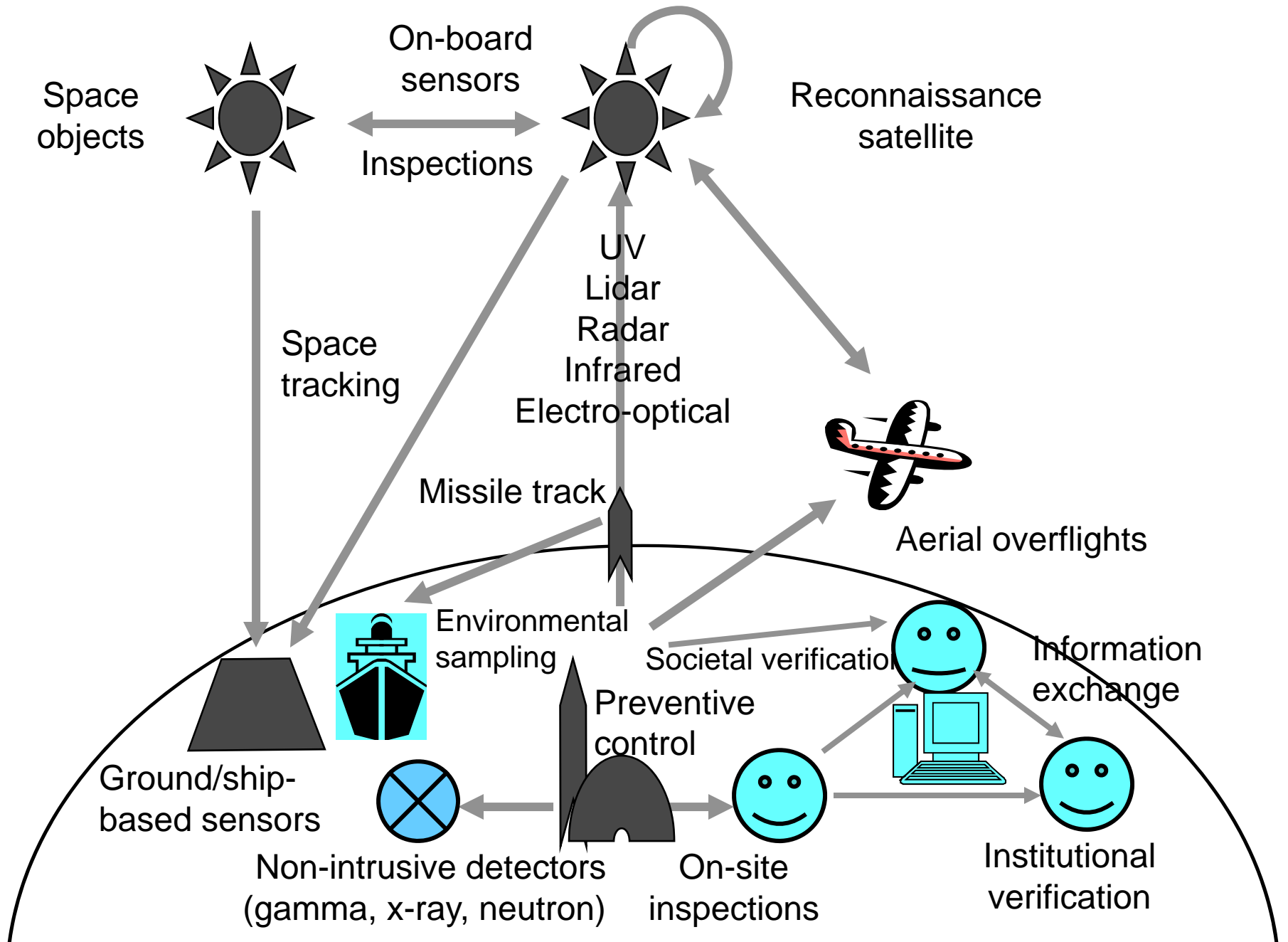
Main tasks for nuclear disarmament verification



Integrated verification concept



Instruments for monitoring and verification



Remote sensing

Example: Natanz, Iran

Apparent attempt to hide an underground uranium centrifuge enrichment facility



Source: F. Lamb, M. Kalinowski, J Scheffran, Nuclear Weapons and Arms Control (Physics 280), spring 2005, University of Illinois
p. 50

Portal monitors



Source: F. Lamb, M. Kalinowski, J Scheffran, Nuclear Weapons and Arms Control (Physics 280), spring 2005, University of Illinois

Nuclear forensics

Fingerprints and forensic analysis have played important roles in criminal law for well over a century.

Nuclear forensics: analyze the nature, use and origin of nuclear materials to determine material characteristics with high accuracy.

Nuclear fingerprint:

- radioisotopes
- isotopic and mass ratios
- material age
- impurity content
- chemical form
- physical parameters

→ Trace small quantities accurately in international safeguards

Sampling and analysis of atmospheric gases



Figure 10: Basic Methodology 1
A mobile on-site laboratory samples and concentrates atmospheric-borne pollutants. Local meteorological conditions and the GPS location are also recorded.



Figure 11: Basic Methodology 2
Samples are brought to a field laboratory for analysis.

Need: To detect the presence and nature of nuclear fuel cycle process activities at suspected locations

Application: Away-from-site (stand-off) detection

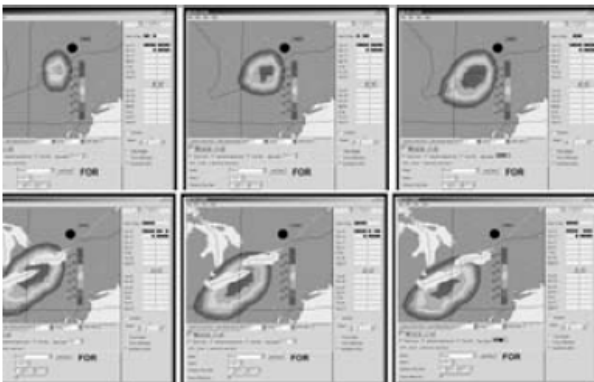


Figure 12: Basic Methodology 3
The sample analysis data is combined with meteorological data and suitable atmospheric modelling to provide an estimate of the source direction.



Figure 13: Basic Methodology 4
The airborne material is identified and the

Proposed Solution:

Use on-site LIBS to determine the nature and history of compounds and elements

Source: J. Whichello, et al., IAEA Project on Novel Techniques, INESAP Information Bulletin No. 27, Dec. 2006

Laser-Induced Breakdown Spectroscopy (LIBS)

Need: To determine whether, or not, an undeclared location has been used previously for storing radiological material

Proposed Solution: Use OSL to measure the radiation-induced signature retained in many common building materials.

Application: On-site verification;
Complementary access inspections



Figure 5: Basic Methodology 1
Unidentified materials found during an on-site complementary access inspection.

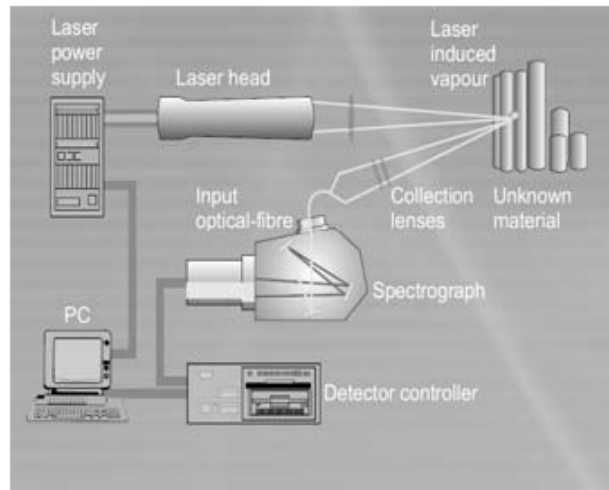


Figure 6: Basic Methodology 2
LIBS is comprised of (i) a laser system to ablate the surface of the material to be analyzed to create a micro-vapour, and (ii) a spectrometer to generate a spectroscopic profile of the micro-vapour's constituent components.



Figure 7: Basic Methodology 3
A trained IAEA inspector operates the LIBS unit on-site. The spectroscopic profile is compared to those in its library to determine the material's make-up and history.

Cooperative verification procedures

- Nuclear archaeology
- Initial declarations and data exchange
- Identification & item counting of objects (tagging, fingerprinting, registration)
- Confidence-building measures, transparency
- Joint overflights (Open Skies)
- Accountancy, control and surveillance
- Preventive controls at nuclear facilities
- Baseline and routine inspections
- Challenge inspections of suspected facilities (anytime-anywhere)
- Personal observation of destruction and suspected activities

Institutional and societal verification

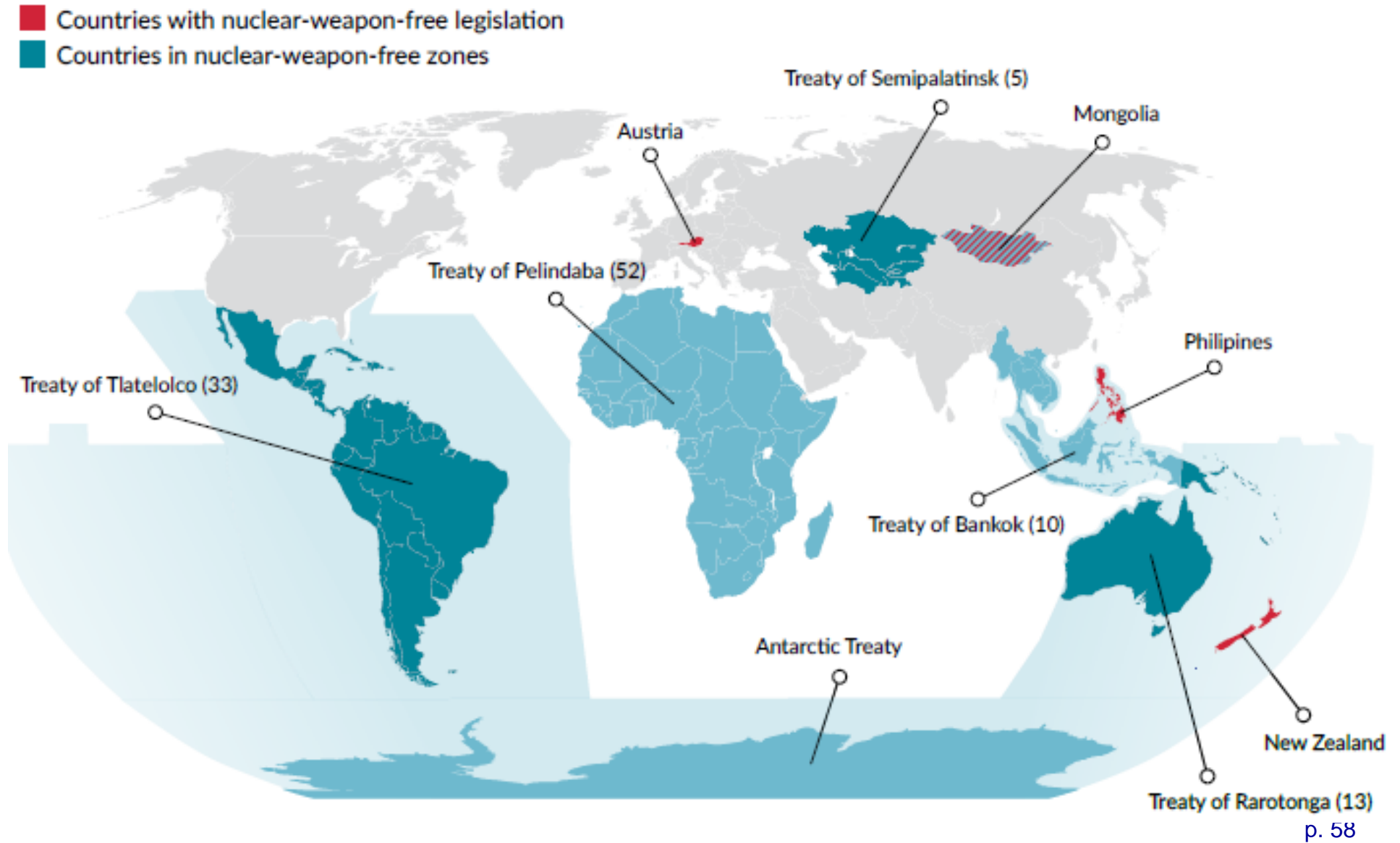
Institutional verification

- International Agency for verification
- Cooperative fact finding on compliance
- Consultations
- Dispute settlement

Societal verification

- Open sources, scientific knowledge
- Espionage
- Citizen reporting and protection, whistle-blowing

Overview of Nuclear Weapon-Free Zones and countries with national nuclear prohibition legislation



Nuclear and Missile Crisis in North Korea



A nuclear-weapon-free Korean peninsula?



**A Northeast Asia NWFZ
A Realistic and Attainable Goal**
An Asia-Pacific Approach to the Nuclear Weapon Free World

Hiro Umeybayashi

**An Analysis of the
North Korean Missile Launch
of 31 August 1998**

David Wright

Issue No.24, December 2004



Information

International Network of Engineers and Scientists Against Proliferation

Bulletin

Model Treaty on the Northeast Asia Nuclear-Weapon-Free Zone

■ Hiromichi Umeybayashi

Missile Defense and the Two Koreas

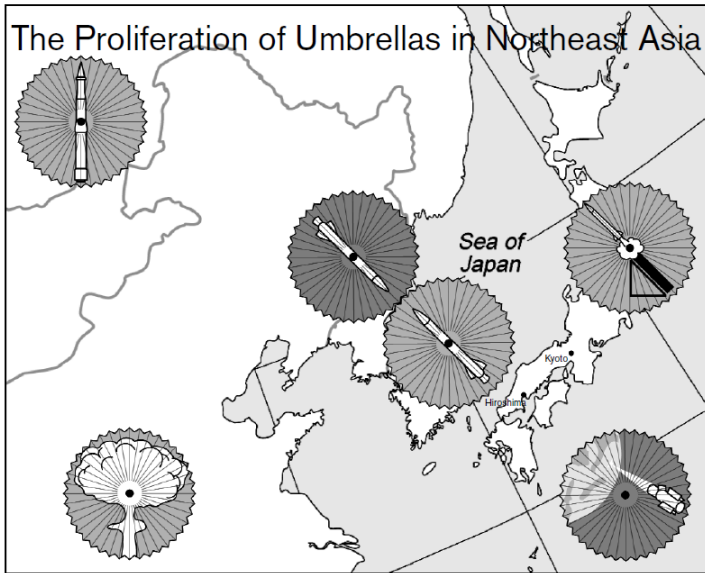
■ Cheong Wooksik

Power Grid Interconnection for a Nuclear Free Korean Peninsula

■ Jungmin Kang

Energy and Security: From Conflict to Cooperation

■ Jürgen Scheffran and Clifford Singer



The Challenge of Hiroshima

- Proliferation and Security in Northeast Asia
- Challenges for Nuclear Disarmament
- Energy and Security
- Terrorism and Weapons of Mass Destruction
- News and Publications

ACDIS program in arms control & domestic and international security
at the University of Illinois at Urbana-Champaign



ACDIS
Security Studies Group



What Does a Trump Administration Mean for Science?

Join us for a panel discussion led by UIUC faculty on the influence the new administration could have on science policy.



Jonathan Coppess
Clinical Assistant Professor of Law and Policy, Department of Agricultural and Consumer Economics
Former Chief Counsel for the Senate Committee on Agriculture, Nutrition and Forestry



Clifford E. Singer
Professor Emeritus, Department of Nuclear, Plasma, and Radiological Engineering
Director of the Program in Arms Control & Domestic and International Security



Donald Wuebbles
Harry E. Preble Endowed Professor, Department of Atmospheric Science
Assistant Director for Climate Science, White House Office of Science and Technology Policy

Have questions for the panelists?
Submit your own at:
illinois.edu/fb/sec/2166166

Presented by the
Science Policy Group
University of Illinois at Urbana-Champaign

4:00 pm
Friday, January 27, 2017
CLSL B102

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