Physics by Press Conference

How discoveries are announced

Phillip F. Schewe, KITP January 2016

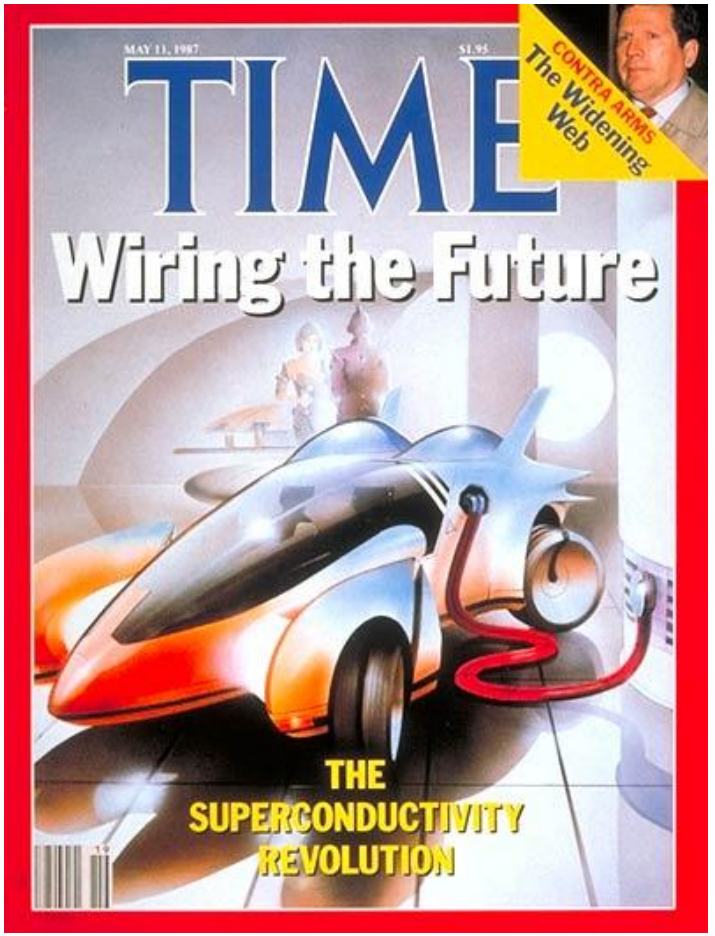
Science is important

Kids are curious

Taxpayers deserve explanations

But scientists *speak Latin*

...we need interlocutors



AIP

news release

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FOR IMMEDIATE RELEASE

HIGHLIGHTS OF THE AMERICAN PHYSICAL SOCIETY (APS) MEETING IN CRYSTAL CITY, VA APRIL 20-23, 1987

APS Directed Energy Weapons Study Released

The major conclusions of the APS Study Group on Directed Energy Weapons (DEW) were discussed at a session held on April 22. Regarding the scientific and technical feasibility of directed energy weapons, weapons which would employ laser light, x rays, or particle beams for use in ballistic missile defense (BMD) systems, the Study Group found that "tne discrepancy between the present state of the art of DEW and the ultimate requirements is so large that major gaps in technical understanding must be closed before engineering technology verification could become productive."

Noting also that the deployment of complex technological systems follows by many years the demonstration of pertinent scientific issues, the Study Group further concluded that "because of the extensive development needed in many technological areas important to the systems, we judge that the deployment of a substantial DEW component in a BMD system cannot be forseen before the year 2000."

At the April 22 session, Kumar Patel of AT&T Bell Laboratories, co-chairman of the Study Group, and other panel members reviewed the

Physics News Update
The AIP Bulletin of Physics News

PHYSICS NEWS UPDATE
The American Institute of Physics Bulletin of Physics News
Number 416 February 26, 1999 by Phillip F. Schewe and Ben Stein

WIRE-GUIDED ATOMS. The development of "atom optics" is part of the effort to store, guide, focus, reflect, and perform calculations with atoms in analogy with the ways electrons are used in electronics and photons in photonics. In a new innovation cold lithium atoms from a magneto-optic trap (MOT) were nudged in the direction of a thin current-carrying wire. Although the atoms are neutral, they still feel the magnetic force field which can be used to send the atoms in two types of trajectory. In one case the atoms spiral in "Kepler" like orbits around and along the wire. In the second case the use of an extra field helps to create a "potential tube" parallel to the wire in which the atoms are guided along the side of the wire. This second guide is especially interesting since the wires can be mounted on a surface, allowing for easy miniaturization of these guides and traps. Physicists at the University of Innsbruck (Joerg Schmiedmayer, joerg.schmiedmayer@uibk.ac.at, 011-43-512-507-6306) expect that this will allow them to design guides and traps for cold atoms with a variety of different geometries. These can be used to manipulate atoms from Bose-Einstein condensates, or serve as beam splitters or interferometers for guided atoms. Even more complicated integrated atom optics devices and networks, similar to integrated circuits for electrons, can be devised. Some mesoscopic experiments which now use electrons in solids might, with this new atom optics tool, be able to use guided atoms moving above a surface. (Denschlag et al., Physical Review Letters, 8 March 1999; see also www.aip.org/physnews/graphics and Physical Review Focus for 28 July 1998.)

HOLOGRAMS OF TRANSISTOR INTERIORS can provide maps of electrostatic potentials in that crucial zone beneath the transistor's gate, where the passage of electrons from emitter to drain can be made difficult or easy, just as a water tap can switch a faucet on and off. Why are such maps necessary? "Within a decade, integrated circuits will consist of transistors 150 atoms long and 50 atoms deep," according to researchers at the Institute for Semiconductor Physics in Frankfurt (Oder), Germany, and knowledge of the precise whereabouts of dopant atoms will be vital. To this end, the Frankfurt scientists (Wolf-Dieter Rau, rau@ihp-ffo.de, 011-49-335-562-5432) can now produce a subsurface sectional map of the transistor. Electron waves from a transmission electron microscope (in which the quantum wavelike properties of electrons are more important than their particle properties) pass through the thin transistor, where they scatter slightly. These waves are recombined with some unscattered electron waves to form a holographic signal which encodes information about local conditions throughout the section. The electron data can be processed into 2-dimensional images with 10-nm resolution and high sensitivity. (Rau et al., Phys Rev Lett, tent. 8 Mar; see www.aip.org/physnews/graphics.)

29 MAR

CERN

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Physics Update

Physics Today's editors identify and summarize newly published papers of broad interest in physics and its related sciences.

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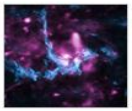
A quantum cascade laser gets a geometric makeover
December 28, 2015 4:36 PM
A change in the areal cross section and orientation of the laser's optical cavity collimates an otherwise divergent light beam.



A sharper view of our galaxy's black hole
December 21, 2015 11:35 AM
An array of radio telescopes has identified magnetic structures close to the event horizon.

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December 17, 2015 10:55 AM

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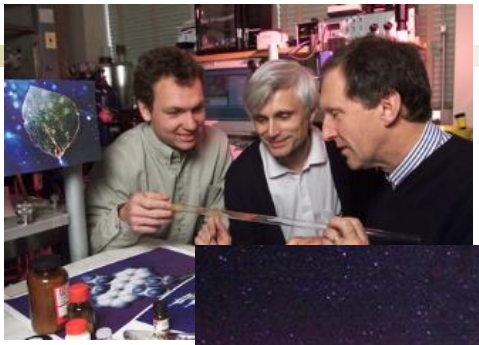
Jan Hendrik Schon

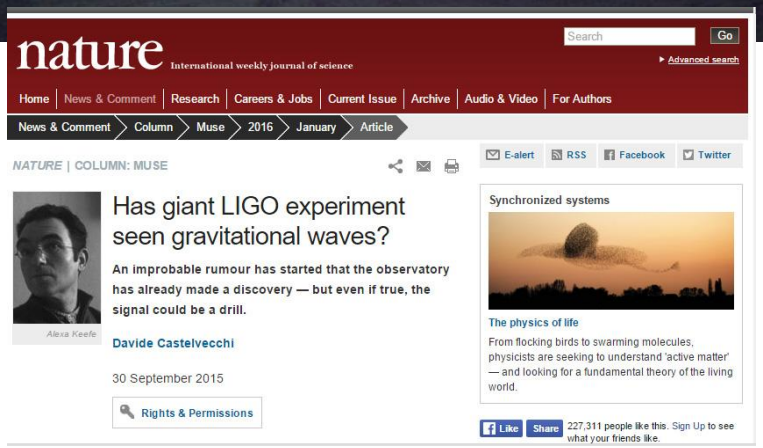
superconducting semiconductor (2001)



BICEP2 detector: cosmic polarization? (2014)

LIGO: gravity wave? (2016)

Associated Press just called



Outline

Eight and a half press conferences

High T superconductivity

Quasicrystals

Directed energy weapons

Cold fusion

Microwave background

Stopped light

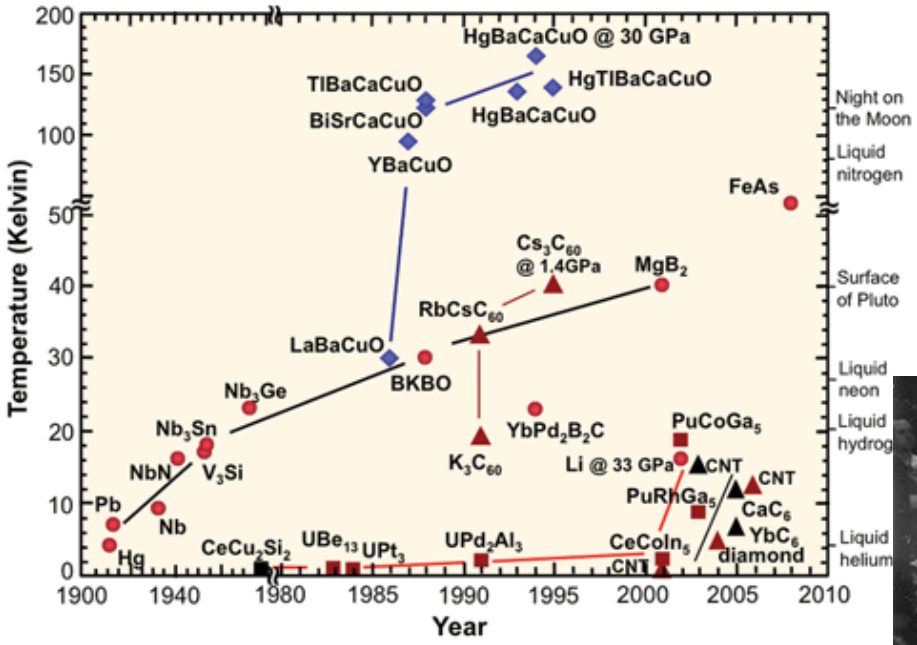
neutrino oscillation

Quark gluon plasma

Solvay: the movie

High T superconductivity

March 1987



The Woodstock of physics

- 50 speakers, Session goes until 3 am
- Two press conferences
- Bednorz and Miller get Nobel later that same year

news release

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HIGHLIGHTS FROM THE PAPERS PRESENTED AT THE AMERICAN PHYSICAL SOCIETY MEETING IN NEW YORK CITY, MARCH 16-20, 1987

High-Temperature Superconductivity

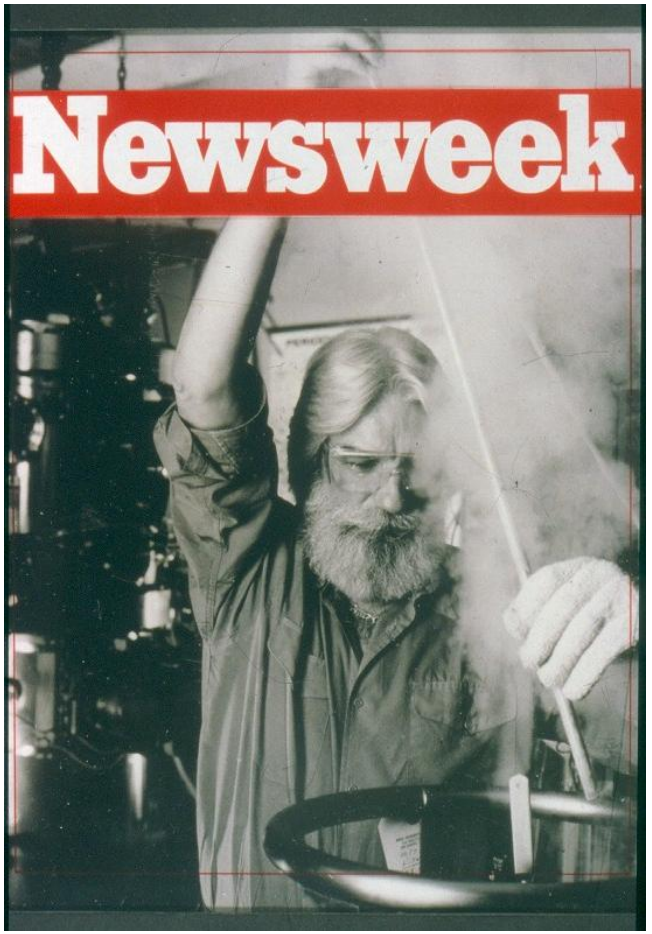
Amid great fanfare and excitement, several groups from around the world announced their discoveries of newly-formulated materials that can achieve superconductivity at dramatically higher temperatures than ever before. Superconductivity is a quantum phenomenon in which the electrical resistance of a material sample vanishes when the material is cooled to low temperatures, usually to within a few degrees of absolute zero. The new discoveries may make possible the economic use of superconductivity for super-efficient computers, mass transit, and possibly power transmission since the new materials would exhibit their superconducting properties at far higher, and therefore far more practical, temperatures.

In a single marathon session beginning Wednesday evening, March 18 and lasting until 3:15 AM the next morning a roster of 51 speakers reported on the dramatically improved superconducting properties of a family of ceramic materials. The materials become superconducting at a temperature above 90 K, a temperature that is still quite cold but warmer than that of liquid nitrogen (77 K). Some scientists at the session described how the new superconductors had already been fashioned into thin films, tapes, and Josephson junctions, some of the basic components in many common electronic devices.

In normal conductors, such as metals, one or more electrons from each atom constituting the lattice structure of the material are free to roam through the solid. When a voltage is applied these electrons, now flowing as electricity, scatter from the lattice sites, thereby dissipating energy. By contrast, in a superconductor no such electrical resistance occurs. According the the BCS theory, named for John Bardeen, Leon Cooper, and Robert Schrieffer, superconductivity arises in some materials when, at very low temperatures, a negatively charged electron slightly distorts the lattice of atoms in the material, drawing toward it a small excess of positive charge, an excess which attracts a second electron. This pair of electrons, a "Cooper pair," can move through the lattice without scattering from the lattice atoms. Hence electrical resistance becomes zero, allowing currents to persist indefinitely as supercurrents.

The superconducting state of a material can be ended by raising the temperature until the thermal agitation of the lattice atoms is large enough to break up the fragile bonds between the members of the Cooper pairs.

Was the subject hyped?

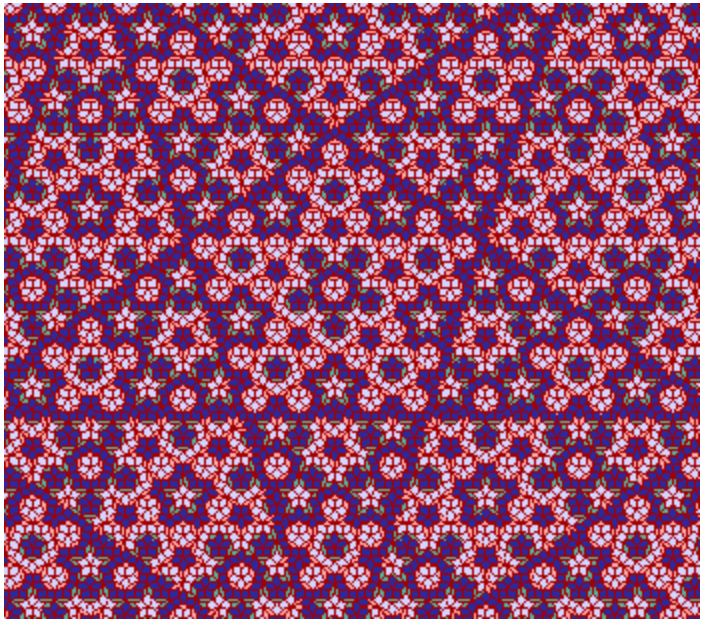


Quasicrystals March 1987

(at the same Woodstock meeting)

Materials with fivefold symmetry. Dan Shectman (chem Nobel in 2011)

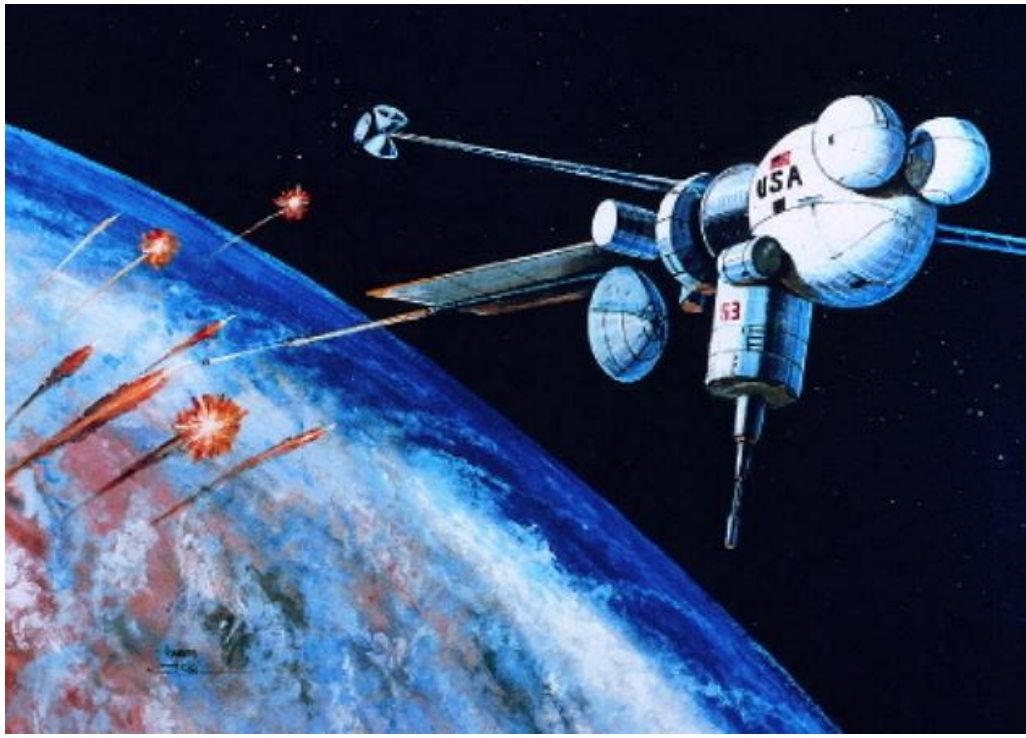
Linus Pauling drama



Directed Energy Weapons

April 1987

- 1983, President Reagan announces Strategic Defensive Initiative, “Star Wars”
- Physicists play a role: APS appoints a committee to investigate efficacy
- Evening Session; Press conference next day
- Embargo time messed up



- Missile defense didn't die, but the space-based version did.

The New York Times

PHYSICISTS EXPRESS 'STAR WARS' DOUBT; LONG DELAYS SEEN

TECHNICAL HURDLES

Feasibility of Futuristic Weapons Questioned in Experts' Study

Bonds in Slump As Dollar Stirs Fear of Inflation

6 Black Workers Reported Slain As Pretoria Moves to Crush Strike

COURT, 5-4, REJECTS RACIAL CHALLENGE TO DEATH PENALTY

New Rules Seek To Cut Asbestos In U.S. Schools

FOES' HOPES DASHED

Justices Are Not Swayed by Study Citing Role of Victims' Color

In Savile Row, Anguish Over a Zoning Plan

Neighbors Now More Likely To Oppose Jails and Shelters

4 NEW FRANCHISES AWARDED BY N.B.A.

Ballistic missile defense systems under scrutiny

Near the end of a televised speech on 23 March 1983 describing his arms budget, President Reagan called on the nation's scientists—in particular "those who gave us nuclear weapons"—to devise a ballistic-missile defense that could eliminate the threat of nuclear attack on populations of the US and its European allies by the turn of the century. Since then, studies of the technical, military and political aspects of the President's Strategic Defense Initiative, usually called "Star Wars" by both friends and foes of the concept, have proliferated. Two days after his Star Wars speech, Reagan initiated the first studies by signing National Security Study Directive 6–83. Under it, the Pentagon formed a Defensive Technologies Study Team led by James C. Fletcher, who headed NASA during most of the 1970s and now is back to teaching at the University of Pittsburgh, and a parallel effort called the Future Security Strategy Study headed by Fred S. Hoffman of Pan Heuristics in Marina del Rey, California. In Congress, the Senate Foreign Relations Committee and House Armed Services Committee directed the Office of Technology Assessment to examine the feasibility, effectiveness and probable cost of a comprehensive space defense system using directed-energy devices and the likely implications for arms control and the future of the Western alliance.

Meanwhile, the Union of Concerned Scientists has completed a fairly comprehensive study of the subject. Other assessments have appeared in publications of the Federation of American Scientists, and a group of military analysts working under the auspices of the Brookings Institution and MIT produced a collection of papers bearing the title *Ballistic Missile Defense* (Brookings, 1984). More recently, the American Academy of Arts and Sciences has agreed to review the military and political policy issues of SDI with Soviet scientists and scholars.

APS study. Now, possibly the deepest inquiry so far into the science and technology of directed-energy weapons is being undertaken by the American Physical Society. Although the study was authorized by the APS Council on 20 November 1983, it was unveiled at the Society's spring meeting in Washington, D.C., 23–27 April. In the interim, the focus of the study was fixed on the scientific, technical and systems aspects of SDI. While APS intends to issue an unclassified report by the fall of 1985, it is intent on heading off criticism that the study group did not know about classified R&D for directed-energy weapons by gaining wide access for the committee to Defense Department laboratories and documents. Supporting this is a letter dated 12 December to L. Charles Hebel of Xerox (then vice-chairman of the APS Panel on Public Affairs) from Richard D. DeLauer, Undersecretary of Defense for Research and Engineering, offering "full cooperation." DeLauer also stated: "I believe that an independent and impartial study conducted by a prestigious professional organization such as The American Physical Society could be highly beneficial in coalescing scientific opinion and creating informed public opinion in fulfillment of the President's aims."

Encouragement for the study also has come from NSF Director Edward A. Knapp. Leaders of the OTA examination of "Star Wars" for Congress have indicated they will rely heavily on the findings of the APS study. That's not surprising, considering the group that APS is assembling for the job. Its cochairmen are Nicolaas Bloembergen of Harvard and Kumar Patel of AT&T Bell Laboratories. When fully formed, the study committee will have at least 15 members. It will operate on a budget estimated at $660 000, which is being sought from both government and foundation sources to avoid the accusation "He who pays the piper calls the tune."

Bloembergen and Arthur Schawlow shared half the 1981 Nobel prize in physics "for their contribution to the development of laser spectroscopy." Bloembergen's research has been in nuclear and electron paramagnetic resonance, solid-state masers and nonlinear optics. He received a BA in 1941 and an MA in physics from the University of Utrecht. In 1946 he went to Harvard, where he wrote his thesis with Edward Purcell. His PhD was awarded in 1948 by the University of Leiden. From 1949 to 1951 he was a junior fellow in the Society of Fellows at Harvard, where he has been ever since, except for visiting professorships. In 1957 he was appointed Gordon McKay Professor of Applied Physics and since 1980 he has been Gerhard Gade University Professor.

Patel's research has been on gas

BLOEMBERGEN

PATEL

0031–9228 / 84 / 0600 53–02 / $01.00 © 1984 American Institute of Physics

Some physicists speak out in favor of Star Wars research

The physicists who wrote and are circulating petitions opposing Star Wars have sometimes made the claim that it is hard to find any physicist willing to defend the general concept of a leakproof missile-defense system. While the claim sounds implausible, the anti-SDI petitioners are not alone in advancing it. Physicist and science writer Jeremy Bernstein, reviewing William J. Broad's book *Star Warriors* in the *New York Times Book Review* recently claimed that Broad was "not able to find a single scientist" who would say that a leakproof nuclear umbrella could be built.

BUCHSBAUM

At another extreme, Lieutenant General James A. Abrahamson, the chief of the SDI program, has claimed that opposition to Star Wars among scientists is confined to "a few diehards." Roughly 2500 members of science faculties had signed petitions and is chairman of the White House "this is the wrong question." By compartmentalizing crucial functions and by building redundancy into the system, one could design a system that would be—like the telecommunications network—much more reliable than its components, Buchsbaum said.

Danny Cohen, a computer scientist who headed a 1985 panel that evaluated potential software for SDI, said at the same hearings: "There are those who claim they cannot produce adequate software. We agree that they cannot. There are experts who claim they can. We agree with them." Cohen argued that an adequate system could be designed by relying on autonomous redundant subsystems with different program codes.

Charles Seitz, a computer scientist who also served on the SDI software panel, told PHYSICS TODAY that he considers most scientific objections to Star

APS and Academy members polled on SDI; physicists mobilize

Physicists, as people who prize intellectual prowess, tend to be suspicious of mass public-opinion polls. Despite that or maybe because of it, they continue to sign petitions for or against the SDI program in great numbers, and when polled on the subject, they show a willingness to express their opinions at considerable length.

The Cornell–Illinois anti-SDI petition continues to gather signatures on university campuses (see PHYSICS TODAY, November, page 95). As of 13 May, when a press conference was held in Washington to publicize the latest results, 3700 faculty members and 2800 graduate students had pledged not to engage in SDI research. Majorities in 59 physics "research departments," as defined by petition organizers, had taken the pledge, according to David Wright of the University of Pennsylvania.

Signatories of the Cornell–Illinois petition include a large number of prominent physicists, ranging from Philip W. Anderson and Subrahmanyan Chandrasekhar to Carlo Rubbia and Steven Weinberg.

A new anti-SDI petition circulating at industrial and national laboratories is sponsored by about a dozen scientists

SHURCLIFF

tude. . . .

The stated goal of the SDI is developing the means to render nuclear weapons "impotent and obsolete." We believe that realization of this dream is not feasible in the foreseeable future. The more limited goal of developing partial defenses against ballistic missiles

HOFFERT

over where their money comes fro and in some cases taking a pledg might be tantamount to promising t resign.

Hohenberg says that "the letter is a attempt to redress the view propoun ed by some SDI officials that opponent to SDI are not in the mainstream of th scientific community" (see PHYSICS TO

86-426

WEDNESDAY, 15 OCTOBER 1986

SDI/SCIENTISTS/GRAHA

WASHINGTON POST 15 OCTOBER 1986 Pg. C-1

In Growing Protest, Scientists Vow to Shun SDI Research Funds

By Barbara Carton
Washington Post Staff Writer

David Roper, 51, a physics professor at Virginia Polytechnic Institute and State University, describes himself as a Democrat who occasionally votes Republican and as a person who belatedly came to oppose the Vietnam War. He views President Reagan's Strategic Defense Initiative as a technical impossibility.

Roper is one of thousands of scientists nationwide who have declared their "strong opposition" by pledging not to accept or solicit research funds for so-called Star Wars projects. "We don't need a huge, multimillion-dollar weapons system," said Roper. "We need more of what they were trying to do at Reykjavik."

Although the protest has slowly been

Roper's institution, 45 percent of the 38 full-time members of the physics faculty have signed the pledge.

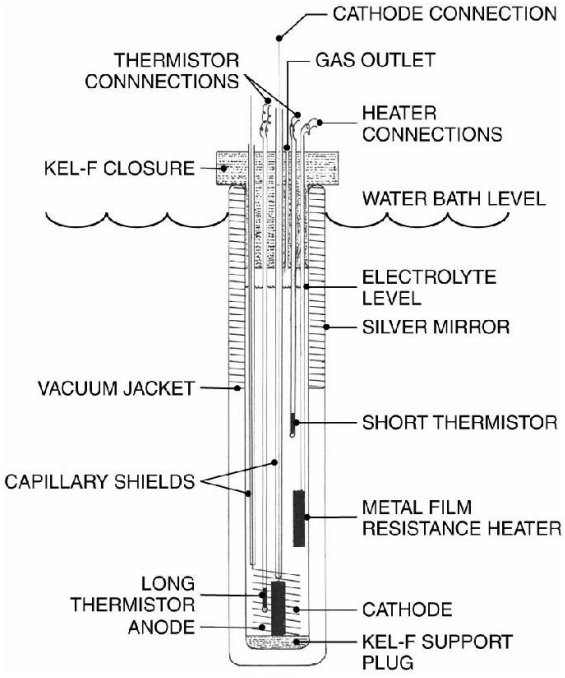
Those protesting represent an admittedly small percentage of the scientists who could do SDI work, and the government has had no trouble placing SDI research contracts. Further, many businesses, including some in the Washington area, are competing vigorously to attract SDI funds.

At the University of Maryland, 57 percent of the physics department members and 58 percent of the meteorology department members have signed. Although Patrick Rapp, a physics research scientist, said there has been no overt reaction to the Iceland summit, he said one physics blackboard contains the scrawled message: "Paralyze the SDI Headquarters."

old biochemist at the University of Virginia, where more than 40 percent of the 64 full-time chemistry, mathematics and chemical engineering professors have signed the pledge. The pledge has circulated at George Mason University in Fairfax, and 58 percent of the physics department faculty members have signed. Pledge organizers said they have not had much contact with Georgetown University, George Washington University or Catholic University.

Signatures are still being sought at the College of William and Mary, and 40 percent of the physics faculty members have signed, the organizers said.

Nationwide, nearly 7,000 scientists, including 57 percent of the combined faculties of 20 of the nation's highest-rated university physics departments, have declared their "strong opposition" to Star Wars by



Feb: chemistry meeting

April: physics meeting

cientists Cheer Fusion-in-Jar Experimenter

I W. BROWNE
ew York Times

? — A Utah scientist applause from 7,000 he described an ex- id had produced nu- simple electrolytic

of the scientists at- ial meeting of the al Society here ap- ne interpretation of the scientist, Dr. B. w physicists expert ded the meeting ap- al.

act, that the fusion d out at the Univer- nounced March 23, n between chemists may take years of resolve. Nuclear fu- udied by physicists, ges that occur in the hemists investigate the electronic interactions of entire atoms and molecules.

Dr. Pons and his collaborator, Dr. Martin Fleischmann, an electrochemist at the University of Southampton in England, startled scientists with their initial public report, which was made at a news conference at the University of Utah, where Dr. Pons heads the chemistry department. They said they had obtained a large excess of energy from a simple electrolytic cell, in which an electrical current passed through heavy water (water in which hydrogen is replaced by its heavy isotope, deuterium) set off hydrogen fusion in a palladium cathode.

Unlike fission, in which atoms are split to release energy, fusion is the joining together of the nuclei of hydrogen atoms to produce helium and enormous amounts of energy. Fusion normally occurs only at temperatures and pressures rivaling those of the sun. If means could be found to harness any form of hydrogen fusion as a commercial source of power, some scientists believe that energy shortages that seem likely to occur in the next few centuries could be forestalled.

The symposium today at the American Chemical Society was unprecedented, both in size and in the haste in which it was prepared, according to Dr. Clayton F. Callis, president of the organization.

Long applause fol expression of satisf ists rather than sci other discipline were what might be a m ery.

But one of the five the discussion, Dr. told scientists at physicists expert in ready to accept Dr. tion of his experimen

Dr. Furth, who he University Plasma ry, said that two proaches to hydrog seemed on the verg One, in which Prince er, aims at achievin powerful magnetic electrically charged gen gas. The other m sion of small capsule been likened to the of tiny hydrogen bom

Asked by a scient here whether he beli experiment had ach sion, Dr. Furth repl point in trying to lea ing scientists. What deal more experime

He added: "One o would like to see wo of this one, but using stead of heavy wate sult was obtained water, he said, ther experiment would s sive.

Theory on Wh

If results were co plication would be responsible for the i

Dr. Pons theoriz charged deuterium sorbed into a crysta ladium and forced t close together that repulsion is overco fuse, releasing neutr

Standard theories that more neutrons should be created

'usion' Patents Sought

By WILLIAM J. BROAD

ts Institute of Tech- day that it had ap- volving cold nuclear theoretical work of n, a university re- s submitted four theory to scientific

to add new support by scientists from d that they had usion at room tem- ple laboratory ap- eir announcement, he world have been their work and de- lain their results.

ials at M.I.T. re- tails of the theoreti- ents. Dr. Hagelstein d for comment.

tical work is gen- ble in itself, it can actical applications an be awarded.

Investigators'

e university's pro- ement saying, "We e Professor Hagel- explanation for 'cold

the phenomenon can be produced on an industrial scale, cold fusion could have revolutionary importance as a new source of energy. Fusion, in which atoms are joined to produce energy, usually occurs only at enormous temperatures and pressures.

Dr. Hagelstein is a 34-year-old associate professor in M.I.T.'s department of electrical engineering and computer science. A decade ago, as a graduate student at the university, he pioneered what eventually became the world's first X-ray laser while working at the Lawrence Livermore National Laboratory in California. The laser became a pivotal part of the proposed "Star Wars" antimissile defense system.

Eugene F. Mallove, a spokesman for M.I.T., said yesterday that it appeared that at least some of the papers had been submitted to Physical Review, a physics journal of the American Physical Society.

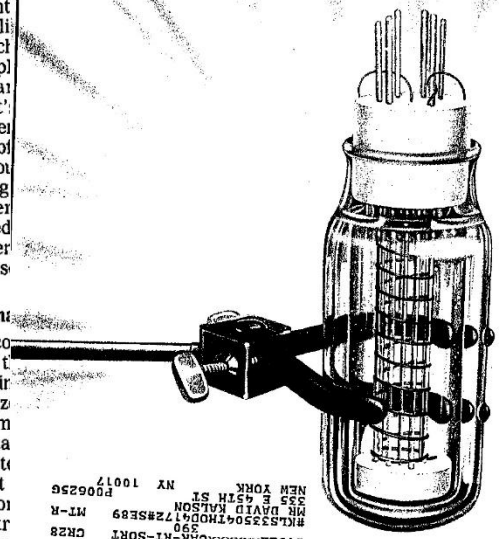
An official in the journal's office had no comment on whether the papers were there.

A statement by the university quoted Dr. Hagelstein as saying his papers described "a speculative theory on the

CHINA'S DEFIANT STUDENTS
On the March for 'Freedom'

Newsweek

The Race for Fusion



The Scientific Debate

Why the Stakes Are So High

▶JAPAN AFTER TAKESHITA ▶THE VANISHING S&Ls

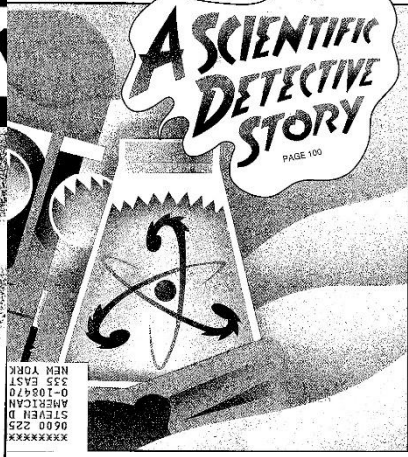
BusinessWeek

MAY 8, 1989 A McGRAW-HILL PUBLICATION $2.00

MIRACLE OR MISTAKE?

FUSION IN OTTLE

A SCIENTIFIC DETECTIVE STORY
PAGE 100



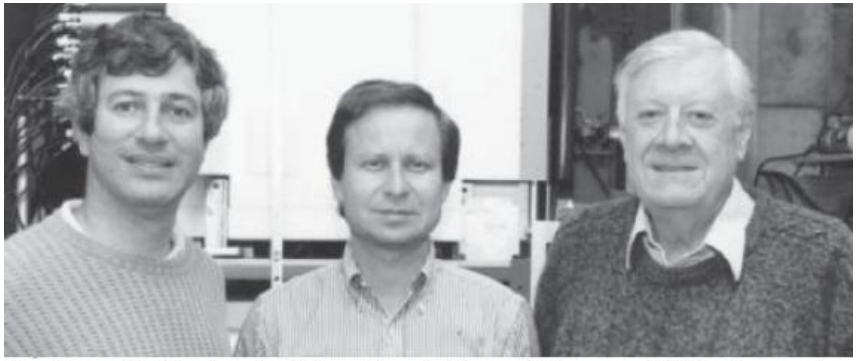
APS meeting

marathon session

“Should the people of Utah be embarrassed? Absolutely.” Steven Koonin

“I can accept one miracle occurring, but not two miracles.” Nate Lewis

“They should have their scientific epaulettes ripped off.” Leon Lederman



The three Caltech scientists who challenged Pons and Fleischmann's (left to right): Nathan Lewis, Steven Koonin, Charles Barnes, 1994.

"All the News That's Fit to Print"

The New

VOL.CXXXVIII.... No. 47,859 Copyright © 1989 The New York Times NEW YOR

‘Fusion’ Claim Is Greeted With Scorn by Physicists

By MALCOLM W. BROWNE
Special to The New York Times

BALTIMORE, May 2 — Hopes that a new kind of nuclear fusion might give the world an unlimited source of cheap energy appear to have been dealt a devastating blow by scientific evidence presented here.

In two days of meetings lasting until midnight, members of the American Physical Society heard fresh experimental evidence from many researchers that nuclear fusion in a jar of water does not exist.

Physicists seemed generally persuaded as the sessions ended that assertions of "cold fusion" were based on nothing more than experimental errors by Utah scientists.

Furor on Initial Claim

Dr. B. Stanley Pons, professor of chemistry at the University of Utah, and his colleague, Dr. Martin Fleischmann of the University of Southampton in England, touched off a furor by asserting on March 23 in Salt Lake City that they had achieved nuclear fusion in a jar of water at room temperature.

At a news conference today, nine of the leading speakers were asked how many would now rule the Utah claim as dead. Eight said yes, and only one, Dr. Johann Rafelski of the University of Arizona, withheld judgment.

Top physicists directed angry attacks at Dr. Pons and Dr. Fleischmann, calling them incompetent, reciting sarcastic verses about their claims and complaining that they had refused to provide details needed for follow-up experiments. A West European expert said that "essentially all" West European attempts to duplicate cold fusion had failed.

Response at Utah University

In a telephone interview, Dr. James Brophy, director of research at the University of Utah, responded, "It is difficult to believe that after five years of experiments Dr. Pons and Dr. Fleischmann could have made some of the errors I've heard have been alleged at the American Physical Society meeting."

The criticism at the regular spring meeting of the society came just before Dr. Pons was scheduled to meet with representatives of President Bush and just after the University of Utah asked Congress to provide $25 million to pursue Dr. Pons's research. A university spokesman said Dr. Pons was in Washington and could not be reached to answer questions.

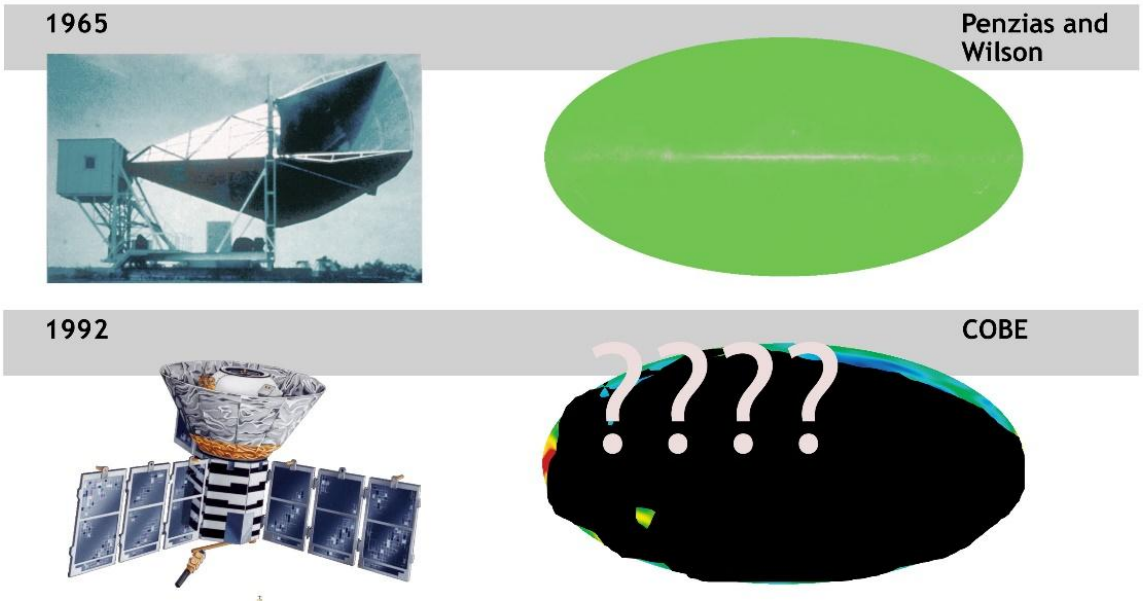
Cold fusion, Dr. Pons and Dr. Fleischmann said, can be initiated in a cell containing heavy water, in whose molecules the heavy form of hydrogen called deuterium is substituted for ordinary hydrogen. When current is

Continued on Page A22, Column 1

Cosmic Microwave background

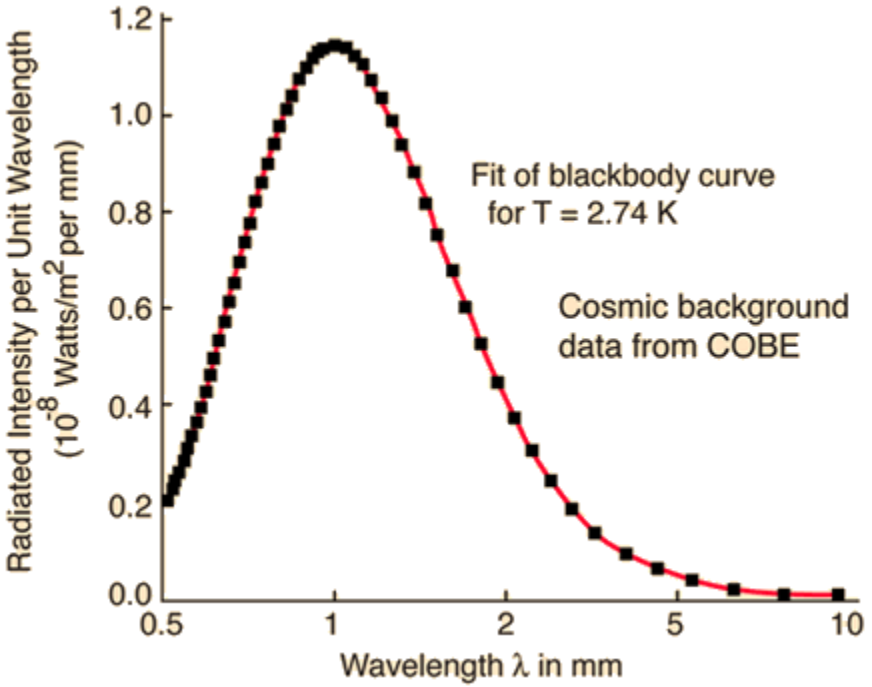
April 1992

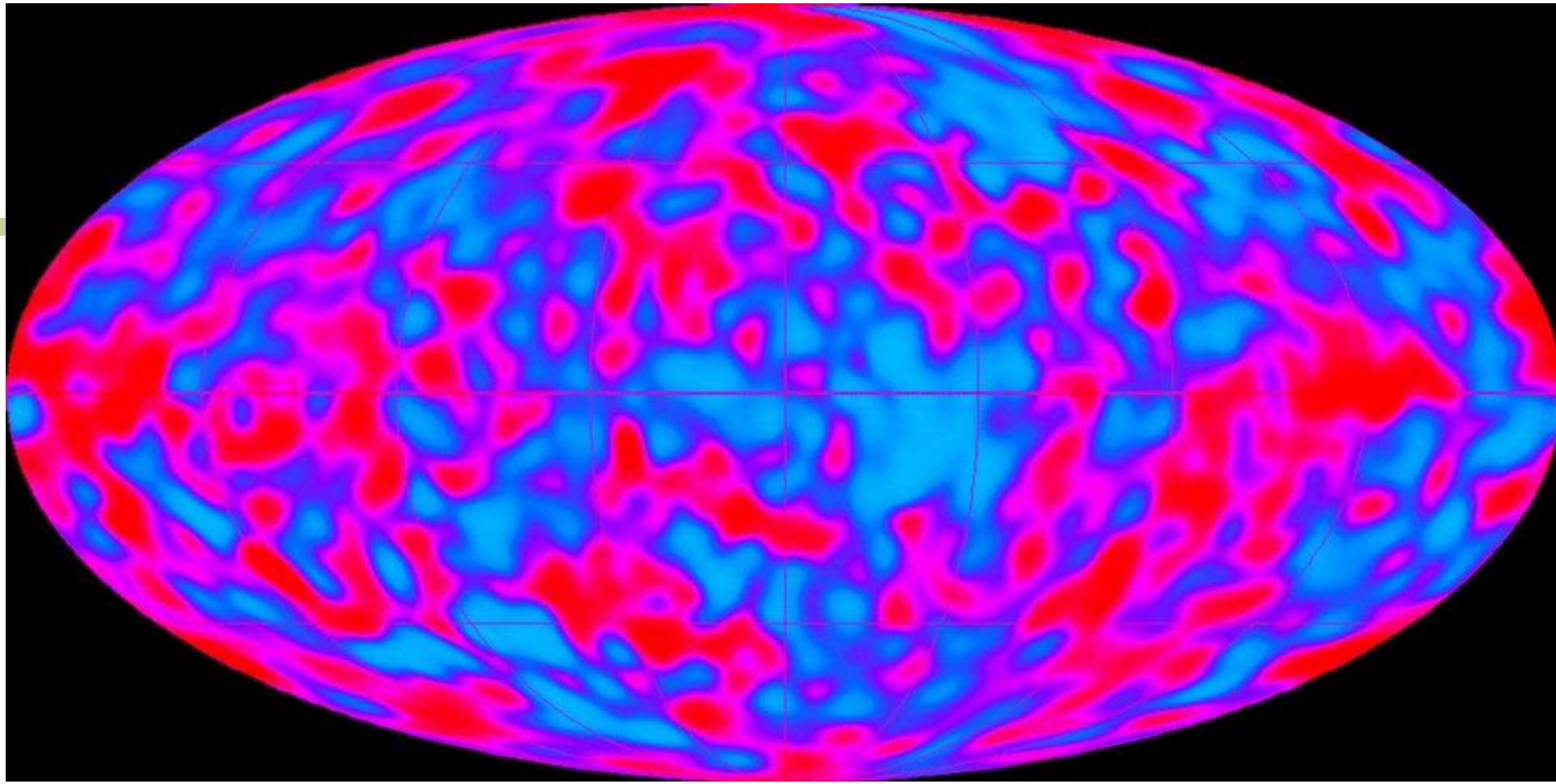
Cosmic Background Explorer (COBE). LBL (Smoot) and Goddard (Mather)



Where to announce big results? Astronomy meeting in Jan. Physics meeting in April

G A S P !


Radiated Intensity per Unit Wavelength
(10^{-8} Watts/m^2 per mm)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.5
1
2
5
10
Wavelength λ in mm
Fit of blackbody curve
for T = 2.74 K
Cosmic background
data from COBE



"...like seeing the face of God"

The New York Times

Late Edition

New York: Today, cooler, var cloudy, rain arriving. High 62 night, rain. Low 52. Tomorrow, damp, raw winds. High 56. Yeste high 78, low 53. Details, page

NEW YORK, FRIDAY, APRIL 24, 1992 50 CEN

Photograph by George Tice

trying to rescue the injured lying under a car that went out of control.

ark, Killing 4 and Injuring Many

A man comforted a woman yesterday after she was injured in the accident in Greenwich Village. As many as two dozen were hurt.

Political Memo

Why Perot Could Pose a Threat With $100 Million: It's His Own

By R. W. APPLE Jr.
Special to The New York Times

WASHINGTON, April 23 — If he runs for President this fall, which seems more likely with each passing day, Ross Perot says he would be willing to spend up to $100 million of his own money on the effort — much more than the major-party nominees could spend on their own account.

He would be free to do so, whereas the major-party candidates would not, because he would not accept any Federal campaign money, and they would. In its decision in Buckley v. Valeo in 1976, the Supreme Court ruled that candidates could spend as much as they liked as long as they took no money from the Government.

At one time, there were outcries in the press and from the opposition about rich candidates trying to buy office. The Rockefellers and Kennedys have often been the targets of such complaints. But in this age of public suspicion of politicians' motives, voters may prefer rich candidates who pay their own way to poorer ones who have to make commitments to lobbying groups or other special interests to stimulate the contributions they need.

Herb Kohl of Wisconsin capitalized on that sentiment in his 1988 Senate campaign. Formerly the head of a family supermarket chain, he used his own money for a television blitz with the slogan, "Nobody's senator but yours." Mr. Perot might do the same, and like Mr. Kohl he would benefit from the fact that in looks and manner he is a million miles from the popular image of a Wall Street predator. Seeming to acknowledge his rising popularity, Mr. Perot today delivered his sharpest criticism yet of President Bush. [Page A20.]

Only John B. Connally in 1980, of all the candidates who have sought the Presidency since 1976, went the self-financing route, and he did not do well. A single convention delegate cost him $12 million.

Independent's Disadvantages

Mr. Perot would need no delegates, of course, since he would run as an independent. But as such he would enter the race with a number of disadvantages that would offset his ability to spend lavishly on his campaign.

He would have to create a campaign organization from scratch. His rivals, presumably Mr. Bush and Gov. Bill Clinton of Arkansas, will be able to rely on town, city, county, state and national party committees, as well as the operations they have built up during the nominating sea-

Continued on Page A20, Column 3

Pennsylvania Governor Criticizes Process That's Turning to Clinton

By MICHAEL deCOURCY HINDS
Special to The New York Times

PHILADELPHIA, April 23 — With Pennsylvania's primary only days away, the state's Democratic Governor today criticized his party's Presidential primary process — and its likely nominee, Bill Clinton — saying the process had produced a front-runner who could not win. He urged the party's uncommitted delegates to remain neutral so that a stronger nominee could be selected at the convention this summer.

"We have to recognize reality," Gov. Robert P. Casey said in an interview today. "The primary process is not producing someone who has a good crack at winning in November." Pennsylvania Democrats hold their primary next Tuesday.

Referring to low turnouts in earlier primaries, Governor Casey said: "We've got a tiny minority of Democrats voting for Bill Clinton, and he's winning every race without generating any sparks, any enthusiasm, any momentum."

Mr. Casey spoke highly of the Arkansas Governor's readiness and intelligence, but added: "People have a tremendous unease about him. He's got a tiny, fly speck of support."

He said the Democratic Party should consider a strategy of having all uncommitted delegates to the convention in New York in July remain uncommitted so that they could consider nominating another candidate should Mr. Clinton fail to win more support.

"He has to address the character issue in some way," Mr. Casey said. "Maybe he can turn this around; I hope he can. But if he can't, convention rules provide for the selection of an alternative candidate. Let's pick a winner."

Mr. Casey, who is in his second term as Governor, said his pessimism about Mr. Clinton's chances increased today when he read public opinion polls of Pennsylvania voters that showed Mr. Clinton running behind President Bush in a hypothetical two-man match-up.

George Stephanopoulos, deputy man-

Continued on Page A21, Column 3

Abortion Rights Strategy: All or Nothing

By LINDA GREENHOUSE
Special to The New York Times

WASHINGTON, April 23 — The strategy that the abortion-rights side ought to the Supreme Court on Wednesday had every appearance of a high-stakes gamble.

Addressing a Court on which support for Roe v. Wade has dwindled to the vanishing point, Kathryn Kolbert, the lawyer for a group of abortion clinics challenging abortion regulation

is broad enough to invalidate every restriction in the Pennsylvania law.

The Bush Administration asked the Court to overturn Roe v. Wade and to declare that states have a "compelling interest" in protecting fetuses from the moment of conception. This would free states to prohibit abortion, as Louisiana, Utah and the Territory of Guam have already done in the expectation that the Court would soon repudiate Roe v. Wade.

Carefully Developed Strategy

While two Justices, Sandra Day

victory for her clients: a narrow decision striking down at least a part of the Pennsylvania law while saving the ultimate battle over the core right to abortion for another day. In risking everything, it seemed, she invited losing everything.

Surprising as it seemed in a court where lawyers typically arrive determined to win their cases on any possible grounds, this strategy was a result of a careful calculation within the abortion rights leadership of where the risks in the fight to preserve the right

SCIENTISTS REPORT PROFOUND INSIGH ON HOW TIME BEGA

'BIG BANG' THEORY BACK

Discovery of Wrinkles in Sp Yields Clue to Developmen of Gravity and Cosmos

By JOHN NOBLE WILFORD
Special to The New York Times

WASHINGTON, April 23 — In a mentous discovery supporting the "Bang" theory for the birth of the verse, astronomers looking back ward the beginning of time have tected broad wrinkles in the fabric space. Their discovery is the first evidence revealing how an initially smooth cosmos evolved into toda panorama of stars, galaxies and gig tic clusters of galaxies.

The scientists detected faint te perature fluctuations in microwave diation echoing from the supposed start of creation. Though the tempe tures fluctuate by no more than a hu dred-thousandth of a degree, they s nal primeval variations in the u verse's topography a mere 300,0 years after its explosive birth.

Creation of Gravity

The variations in topography we large enough, scientists said, to crea the gravity needed to attract more a more matter into increasingly expa sive clumps. These variations had be predicted by theorists but were nev observed until now.

The discovery, made by scientis analyzing satellite data, is being hail as one of the most exciting and impo tant developments in cosmology in th century.

"What we have found is evidence f the birth of the universe and its evol tion," said Dr. George Smoot, an astrophysicist at Lawrence Berkeley Laboratory and the University of California at Berkeley, who led the research.

"This is really a breakthrough, a revolution, in our understanding of the early universe," said Dr. Smoot, announcing the findings at a meeting of the American Physical Society here today.

Cataclysmic Explosion

The nature of the matter creating the density "ripples" has not been determined. But the ripples themselves were created immediately by the original Big Bang. There would not have been time, the scientists said, for the texture to have changed under normal physical processes.

The Big Bang theory holds that the universe began in a single cataclysmic explosion and has been expanding ever since. The concept was first proposed to explain the discovery in the 1920's that distant galaxies are receding from view at enormous speeds, as if they started moving away from the same location a long time ago.

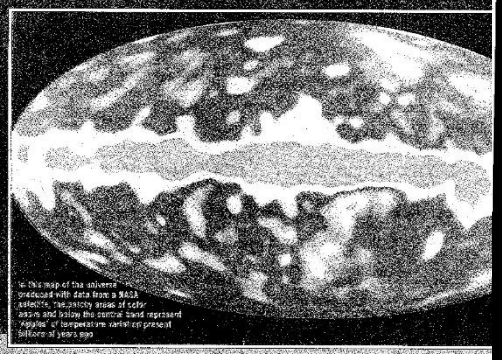
The theory gained its strongest pre-

Continued on Page A16, Column 1

Newsday
THE LONG ISLAND NEWSPAPER

FRIDAY, APRIL 24, 1992 • NASSAU / HEMPSTEAD WEST 40¢

Backing Up THE Big Bang



In this map of the universe produced with data from a NASA satellite, the patchy areas at center and below the narrow band represent "ripples" of temperature variation present billions of years ago.

BASKING IN THE COSMIC GLOW

Astrophysicist George Smoot and colleagues find the ripples of creation

For astrophysicist George Smoot, these were heady if bewildering times. Ted Koppel and Bryant Gumbel were wrestling with his ideas on TV, and when he got back from Washington, D.C., he found his colleagues at the Lawrence Berkeley Laboratory in Berkeley, Calif., had taped a sign on his office door reading HOME OF THE HOLY GRAIL. Inside, Smoot's computer had been temporarily disabled when a shower of confetti jammed the keyboard. Across the hall, graduate students had posted a copy of Smoot's widely reproduced cosmic map and added the heading BEHOLD THE FACE OF GOD. On the weekend, when Smoot ventured outside to mow the lawn, a photographer from *Paris Match*, no less, appeared to snap his picture.

What had this obscure and abstracted man of

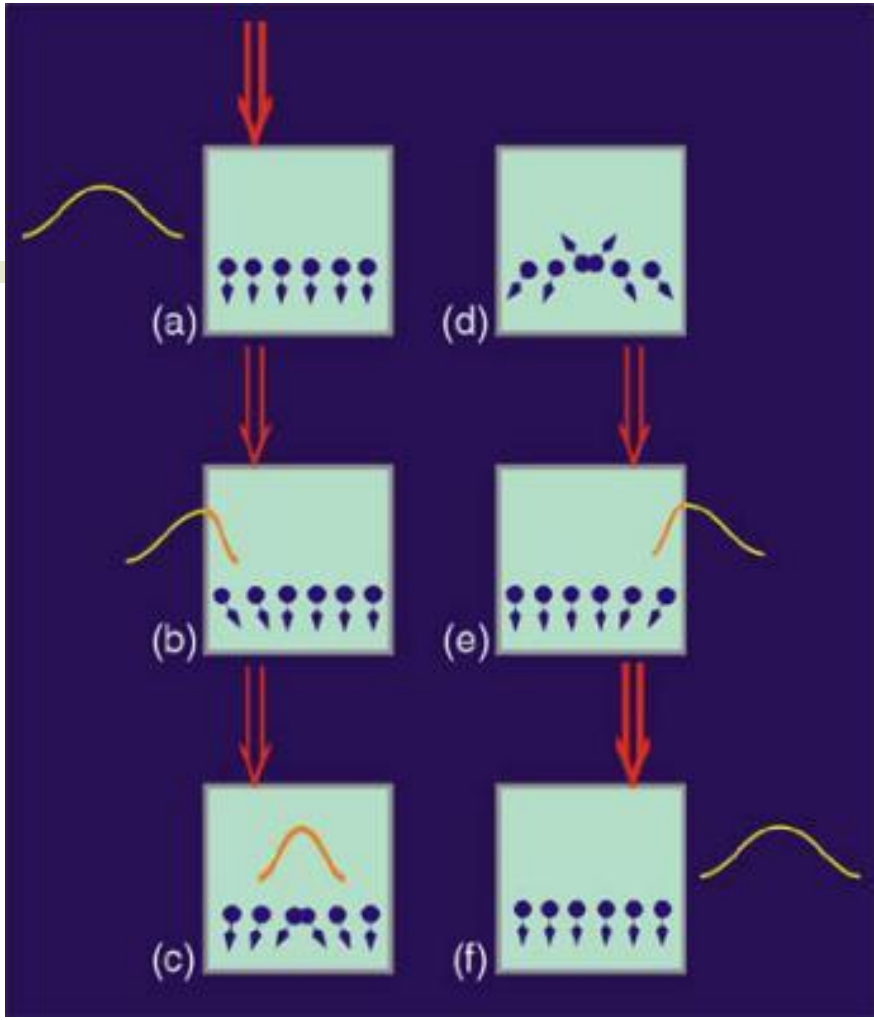
Smoot is suddenly a major wheel at Berkeley.

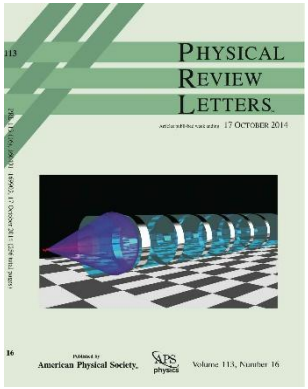
Stopped Light

Jan 2001

Embargoes: PRL (Walsworth and Lukin) vs Nature (Hau)

Exclusive scoop





Mr. Midland Goes to Washington

Hints of Cooperation, Signs of Conflict

Ashcroft on Abortion

Tampa Bay Assistant Chosen to Coach Jets

Congo Says Leader Is Alive but Installs His Son in Top Role

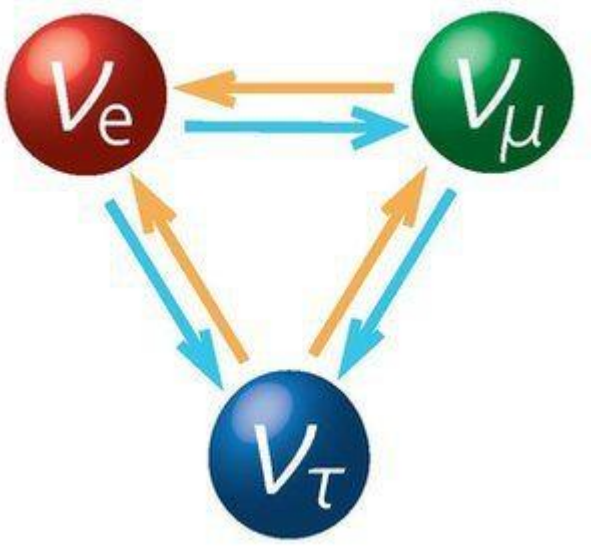
Scientists Bring Light to Full Stop, Hold It, Then Send It on Its Way

---Getting tenure at Harvard

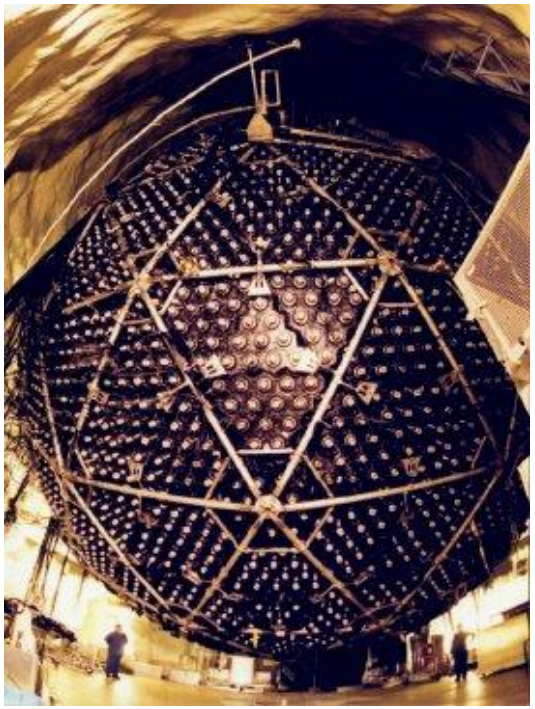
---Explaining to other reporters

Neutrino oscillation

April 2005



- 2015 Physics Nobel: Takaaki Kajita (Kamiokanda) and Arthur McDonald (Sudbury)
- Shortfall of electron neutrinos
- It's news if the New York Times says it's news.



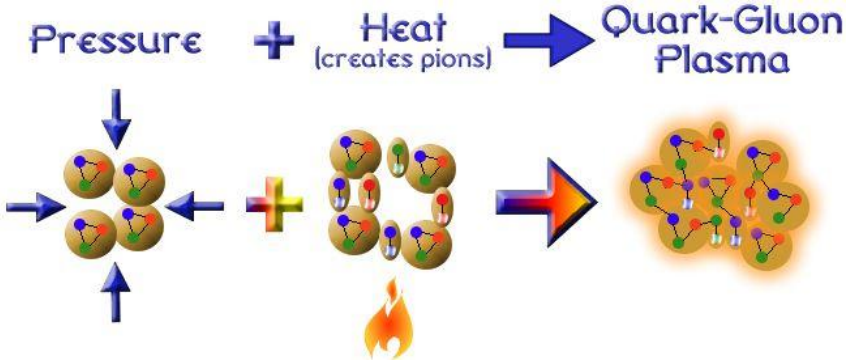
Quark-gluon plasma

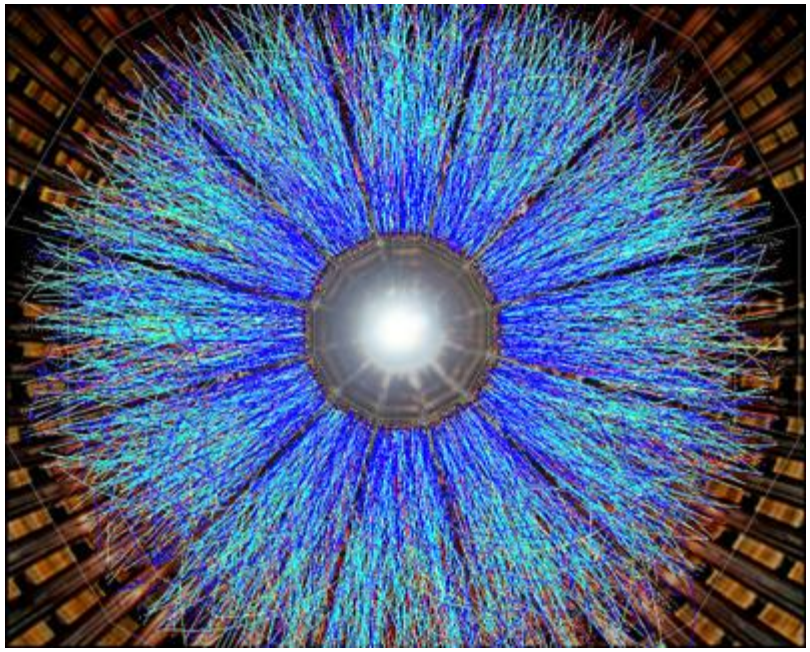
May 2006

--Melting protons: slam gold nuclei together

--6 trillion degrees

--reverse alchemy





Too much information.

Conceptual difficulty: why hold back from announcing QGP?

Solvay: the Movie

Mar 2006

Quantum nay-sayers: Einstein, Schrodinger, deBroglie

Max Born biographer debuts movie filmed by Langmuir