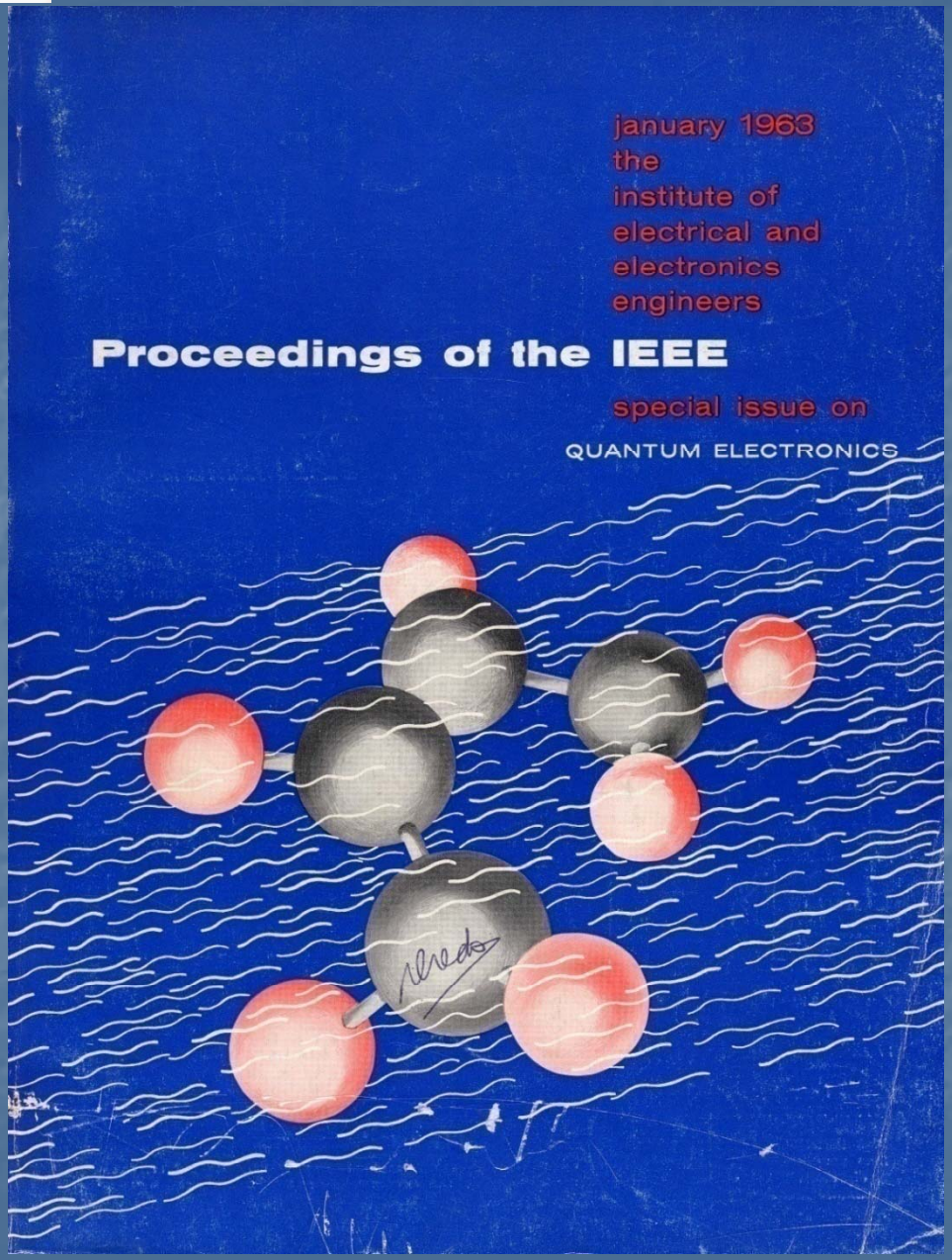
ALBORADA DEL FOTÓN

J.A. Martín Pereda

Universidad Politécnica de Cataluña
4 de noviembre, 2009



Primer número de los "*Proceedings of the IEEE*", en enero de 1963.

Death Ray Machine Is Invented by Cleveland Scientist

Photo shows Cleveland inventor in his laboratory with death ray machine in early stages of development. This machine is said to have proven successful in practice.

REPORTED to have tremendous military possibilities, a successful death ray machine is said to have been invented, after lengthy experiments, by a Cleveland scientist.

A partial description of the machine's construction and operating principles was recently offered at a session of the National Inventors' Congress at Omaha, Nebraska.

Privileged witnesses to demonstrations of the machine declared that experiments were successful to a startling degree. Dogs, cats and rabbits were killed instantly, their blood turning to water as the ray was turned upon them. It is reported that the machine has been suppressed by the government until such time as it may be needed as a defensive weapon.

Modern Mechanix
Sep, 1934

German Death Ray Pistol Stuns Animals at Mile Range

This death ray gun is said to be capable of stunning men or animals at one mile range. The queer magnesium pistol is being demonstrated in Paris by its German inventor.

AN ODD-LOOKING pistol firing a magnesium charge said to be capable of stunning men and animals a mile away is now being demonstrated in Paris. Its inventor, a German who was forced to flee from his native land, hopes to sell the idea to the French government.

Scientists believe the operation of the device is based upon the "thermit reaction" now used in certain welding operations. The reflector mounted on the barrel of the gun would concentrate the deadly heat rays, and protect the operator from the dazzling glare of exploding magnesium.

"Death Ray" May Outlaw War

Prof. Harry May and his "death ray" machine. He hopes it will make nations afraid to start future wars. It is on exhibition at a San Diego, Calif., exposition at this time.

A "DEATH RAY" machine is on exhibition at the California Pacific International Exposition being held at San Diego, Calif. It was invented by Prof. Harry May of London, England.

Prof. May feels that his new lethal weapon will be instrumental in outlawing war. He thinks that nations, knowing that such a weapon for quick destruction is available, will hesitate to attack each other.

Modern Mechanix
Oct, 1936

Inventor Hides Secret of "Death Ray"

Dr. Antonio Longoria, who vows never to reveal his secret of the "death ray"

PIGEONS on the wing instantly killed by death rays from a machine four miles away—that is the feat reputedly accomplished by a deadly apparatus developed by Dr. Antonio Longoria, of Cleveland, Ohio, who recently announced that he had deliberately destroyed the lethal machine for the good of humanity. The Cleveland inventor declared that he had stumbled on the deadly rays while experimenting in the treatment of cancer with high-frequency radiations. The action of the fatal rays, he declared, is painless and they work by changing the blood into a useless substance, much as light transforms silver salts in photographic processes. Before a group of scientists, it is reported, he once demonstrated that the radiations would kill rats, mice, and rabbits, even when the animals were incased in a thick-walled metal chamber. The rays, Dr. Longoria believes, could kill human beings just as easily.

Modern Mechanix
Jan, 1935

TIME
Monday, Aug. 10, 1936

February 7, 1958
NUMBER 5105.15

Department of Defense Directive

SUBJECT Department of Defense Advanced Research Projects Agency

I. PURPOSE

The purpose of this directive is to provide within the Department of Defense an agency for the direction and performance of certain advanced research and development projects.

II. RESPONSIBILITY AND AUTHORITY

A. Establishment

In accordance with the provisions of the National Security Act of 1947, as amended, and Reorganization Plan No. 6 of 1953, there is established in the Office of the Secretary of Defense the Department of Defense Advanced Research Projects Agency. The Agency will be under the direction of the Director of Advanced Research Projects.

B. Responsibility

The Agency shall be responsible for the direction or performance of such advanced projects in the field of research and development as the Secretary of Defense shall, from time to time, designate by individual project or by category.

C. Authority

Subject to the direction and control of the Director:

1. The Agency is authorized to direct such research and development projects being performed within the Department of Defense as the Secretary of Defense may designate.

2. The Agency is authorized to arrange for the performance of research and development work by other agencies of Government, including the military departments, as may be necessary to accomplish its mission in relation to projects assigned.

3. The Agency is authorized to enter into contracts and agreements with individuals, private business entities, educational, research or scientific institutions including federal or state institutions.

4. The Agency is authorized to acquire or construct such research, development and test facilities and equipment as may be approved by the Secretary of Defense, in accordance with applicable statutes. However, existing facilities of the Department of Defense shall be utilized to the maximum extent practicable.

III. ORGANIZATION

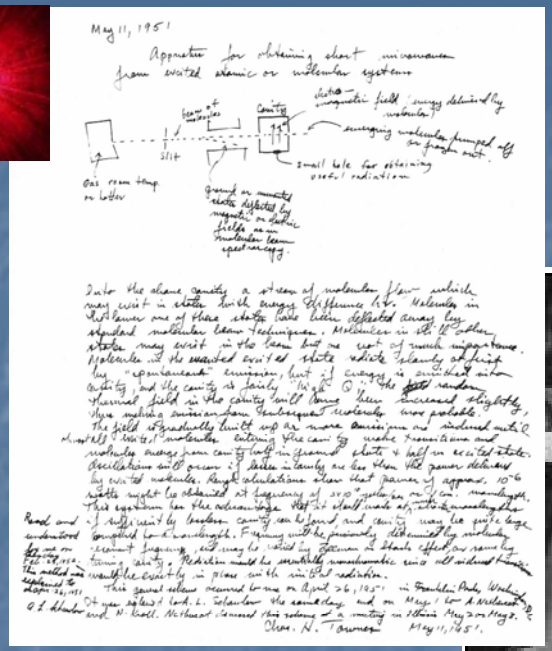
A. The Director of Advanced Research Projects shall report to the Secretary of Defense.

B. The Department of Defense Advanced Research Projects Agency shall be provided such personnel and administrative support as may be approved by the Secretary of Defense.

C. Other officers and agencies of the Office of the Secretary of Defense within their respective areas of responsibility shall provide support to the Director of the Advanced Research Projects Agency as may be necessary for him to carry out his assigned functions.

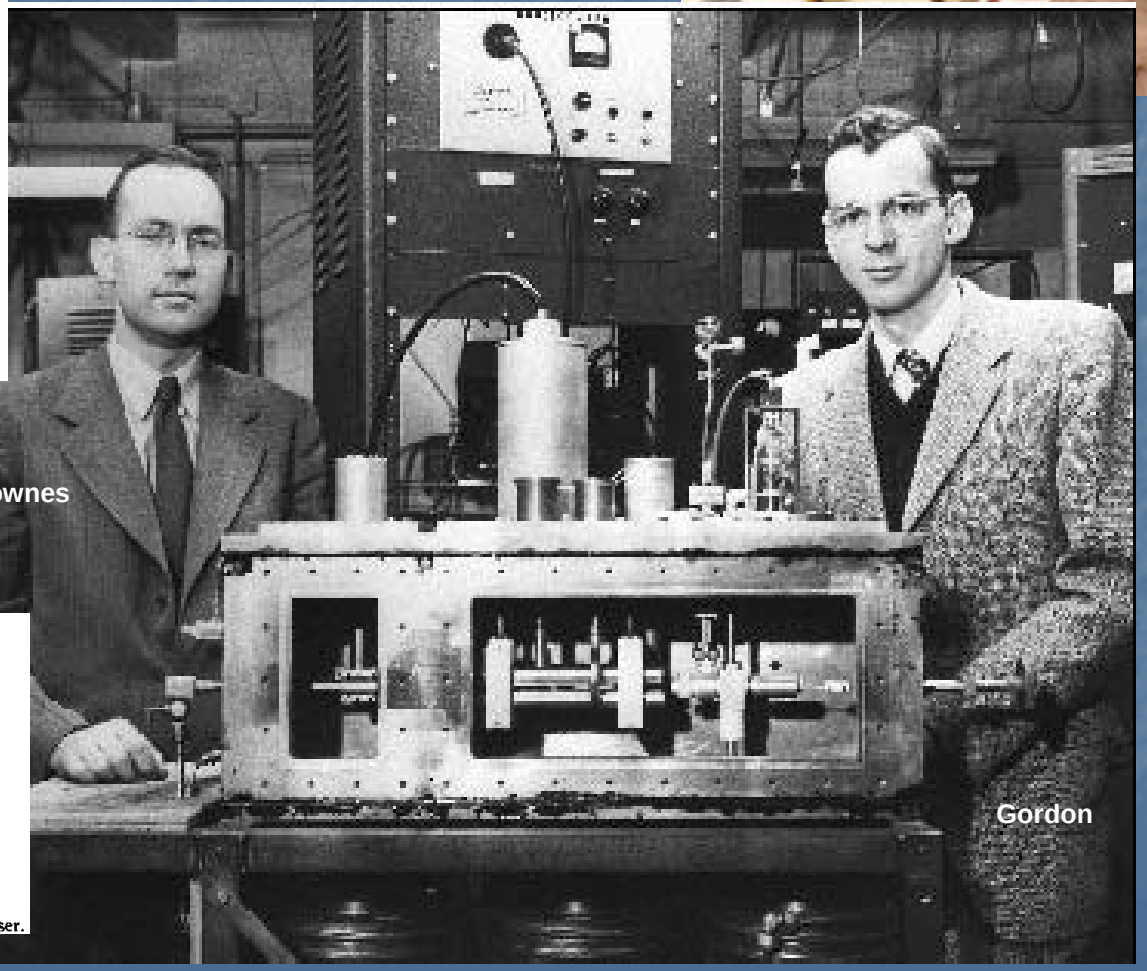
IV. EFFECTIVE DATE

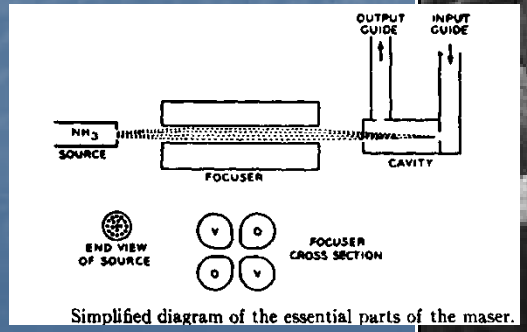
This directive is effective immediately.



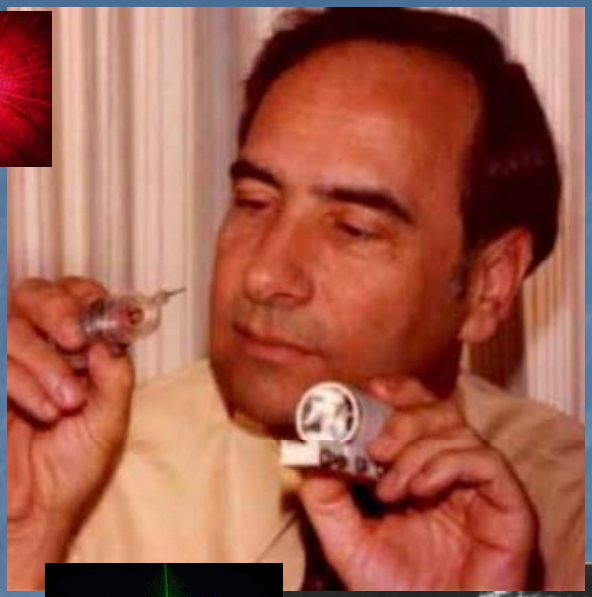
Página del libro de notas de C.H. Townes, en el que se recoje la idea original del máser (11 de mayo de 1951)

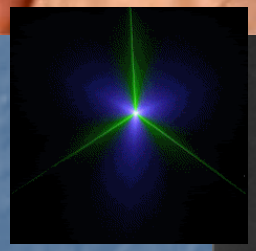
Townes en una conferencia de la Optical Society of America, en 1981, Washington, D.C

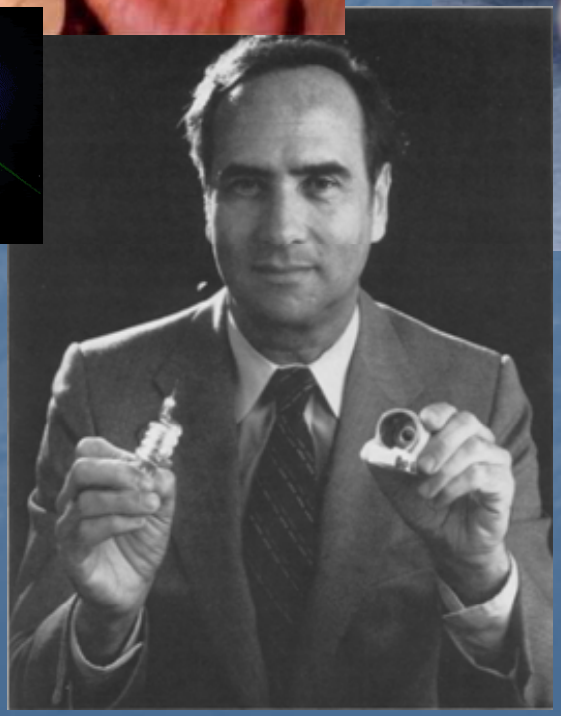




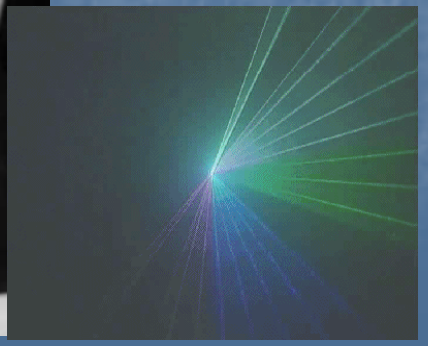
Simplified diagram of the essential parts of the maser.







Maiman con el primer láser de rubí



Maiman con el primer láser falso de rubí

Stimulated Optical Radiation in Ruby

Schawlow and Townes[1] have proposed a technique for the generation of very monochromatic radiation in the infra-red optical region of the spectrum using alkali vapour as the active medium. Javan[2] and Sanders[3] have discussed proposals involving electron-excited gaseous systems. In this laboratory an optical pumping technique has been successfully applied to a fluorescent solid resulting in the attainment of negative temperatures and stimulated optical emission at a wave-length of 6943 Å.; the active material used was ruby (chromium in corundum).

A simplified energy-level diagram for triply ionized chromium in this crystal is shown in Fig. 1. When this material is irradiated with energy at a wave-length of about 5500 Å., chromium ions are excited to the $^4F_2$ state and then quickly lose some of their excitation energy through non-radiative transitions to the ^2E state[4]. This state then slowly decays by spontaneously emitting a sharp doublet the components of which at 300° K. are at 6943 Å. and 6929 Å. (Fig. 2*a*). Under very intense excitation the population of this metastable state (^2E) can become greater than that of the ground-state; this is the condition for negative temperatures and consequently amplification via stimulated emission.

To demonstrate the above effect a ruby crystal of 1-cm. dimensions coated on two parallel faces with silver was irradiated by a high-power flash lamp;

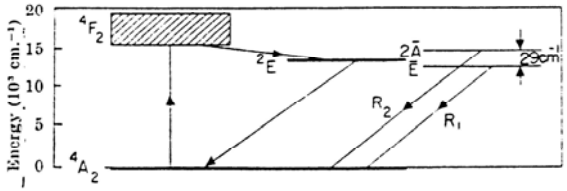


Fig. 1. Energy-level diagram of Cr^{3+} in corundum, showing pertinent processes

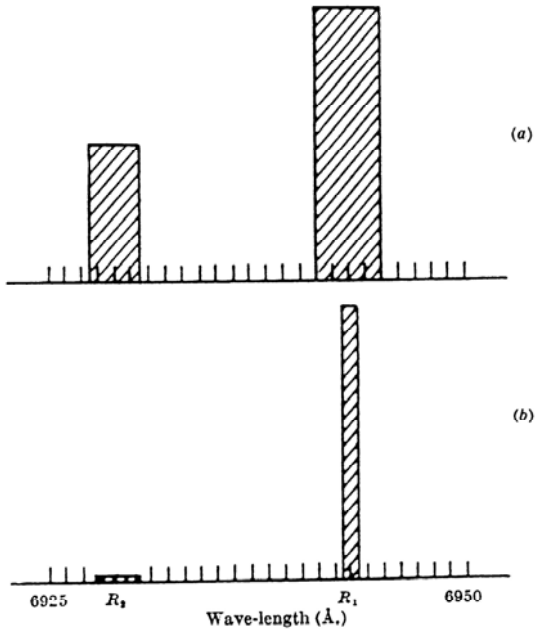


Fig. 2. Emission spectrum of ruby: *a*, low-power excitation; *b*, high-power excitation

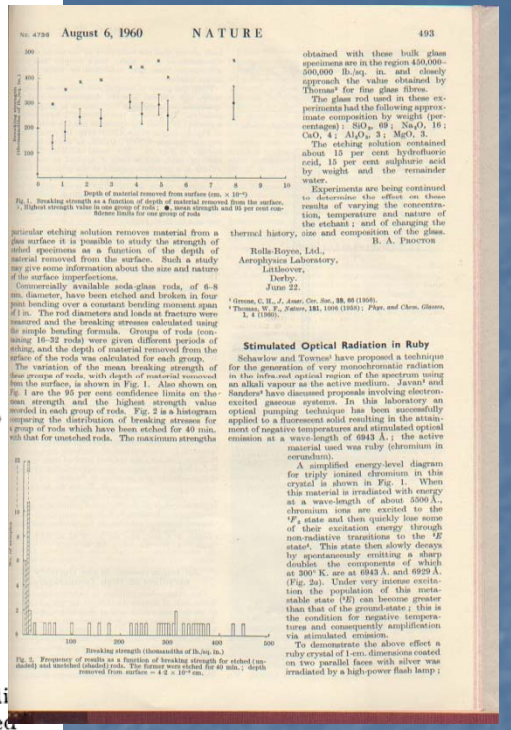
the emission spectrum obtained under these conditions is shown in Fig. 2*b*. These results can be explained on the basis that negative temperatures were produced and regenerative amplification ensued. I expect, in principle, a considerably greater (~ 10^8) reduction in line width when mode selection techniques are used[1].

I gratefully acknowledge helpful discussions with G. Birnbaum, R. W. Hellwarth, L. C. Levitt, and R. A. Satten and am indebted to I. J. D'Haenens and C. K. Asawa for technical assistance in obtaining the measurements.

T. H. Maiman

Hughes Research Laboratories,
A Division of Hughes Aircraft Co.,
Malibu, California.

[1] Schawlow, A. L., and Townes, C. H., *Phys. Rev.*, 112, 1940 (1958).
[2] Javan, A., *Phys. Rev. Letters*, 3, 87 (1959).
[3] Sanders, J. H., *Phys. Rev. Letters*, 3, 86 (1959).
[4] Maiman, T. H., *Phys. Rev. Letters*, 4, 564 (1960).



Nature
August 6, 1960,
Vol. 187, No. 4736,
pp. 493-494.

Electronic News

THE INDUSTRY'S WEEKLY NEWSPAPER • A FAIRCHILD PUBLICATION

Today's Index

ComLogNet May Include Griffiss AFB

Westinghouse Unveils SiC Transistor

Midwest Apathy Hit At Chicago Conclave

By GEORGE M. DRAKE and NAT SNYDERMAN

CHICAGO.—The Midwest was flayed here last week for uninspiring work in electronics, for the failure of its universities to exercise leadership, for lack of imagination by industry, and for the wrong psychological climate for creative work.

Cost of NEAR System Put at $40-50 Million

CHICAGO.—Total cost of a National Emergency Alarm Repeater (NEAR) system was estimated at between $40 million and $50 million in a paper delivered last week at the Fall General Meeting of the American Institute of Electrical Engineers.

Research Held Key to Growth On Long Island

By ED NANAS

Hughes Studies Optical Radar as First Laser Use

By ALEXANDER E. TAKACS and RUSSELL J. BAILEY

BOSTON.—An optical radar set is being investigated by Hughes Aircraft Co., Culver City, Cal., as the first application of its optical maser.

This was disclosed by T. H. Maiman of Hughes Research Laboratories, at a private briefing session before he delivered

Control Units Seen Focus of Europe Parley

By MICHAEL SHERIDAN
GERMAN BUREAU

Pique Leaves Hoffman Post As of Oct. 31

By ROBERT HENKEL

LOS ANGELES.—E. W. Pique, corporate vice-president, marketing, for Hoffman Electronics Corp., here, will resign, effective at the end of October, it was learned last week.

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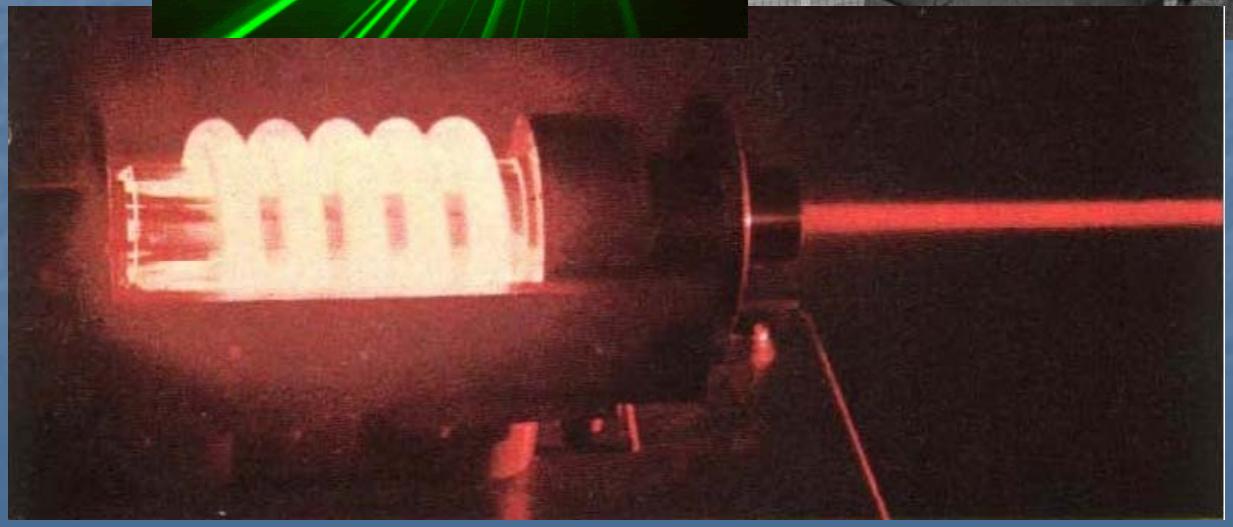
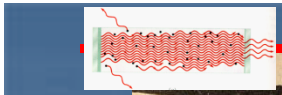
Raytheon Converter Gives 5 Million Analog-Digital Conversions Per Second

RAYTHEON



Maiman y D'Haenens con su primer láser, 25 años después


PEA



The Perris Progress

CENTS

YOUR HOMETOWN NEWSPAPER

SERVING THE BEAUTIFUL VALLEY SINCE 1901

9 — NUMBER 1 PER RIVERSIDE COUNTY, CALIFORNIA 92376

nd com- to the District.

Troublesome Christmas trip for 3 students

We hope your Christmas trip was a happy one says Fernando Martinez, Luis Lopez and Jose Marin-Pereda, because their trip has been a trying and eventful trip.

All three of these young men are from Madrid, Spain, but are in this country studying at Colorado State University on a Fullbright Scholarship. Fernando and Luis are working on their masters degree and Jose is studying for his Phd.

They decided to take a small trip over Christmas Vacation, taking in the southwestern U. S.

Trouble didn't raise its ugly head until just outside of San Francisco where the clutch on the car started acting up. Then they blew two tires and had to replace them at a cost of about $45.

Tires fixed and off to Los Angeles, but when they arrived the clutch went completely out, and it had to be repaired. Another $150.

While their car was being repaired they had no place to stay, as they had been staying in the car. Fernando called a friend whom he had met in the Netherlands. He not only invited them to spend the night, but also to spend Christmas with him.

With the clutch fixed, and feeling merrier they headed for Tijuana.

Sun City was their next and final 'Waterloo' as the engine broke down to the tune of approximately $200 This was the end of the line as they had only paid $350. for the car to start with.

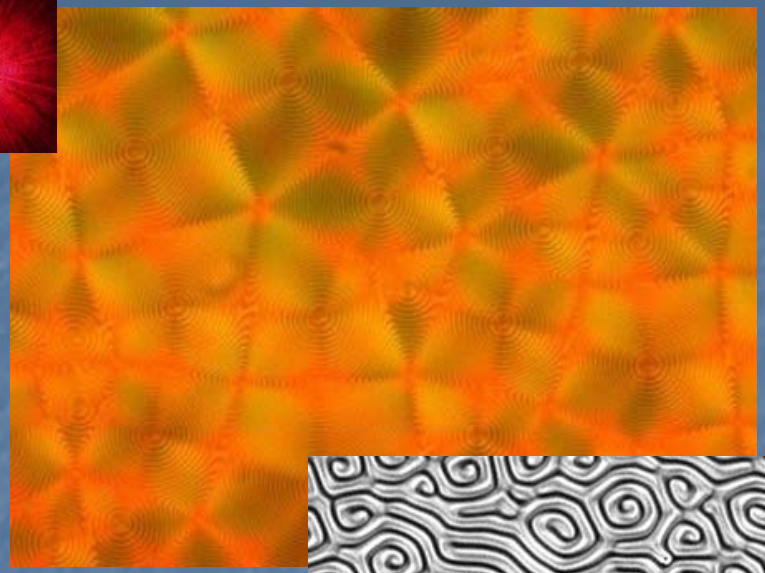
They sold the car for $15 and hired a taxi to take them to the Greyhound Bus Depot in Perris.

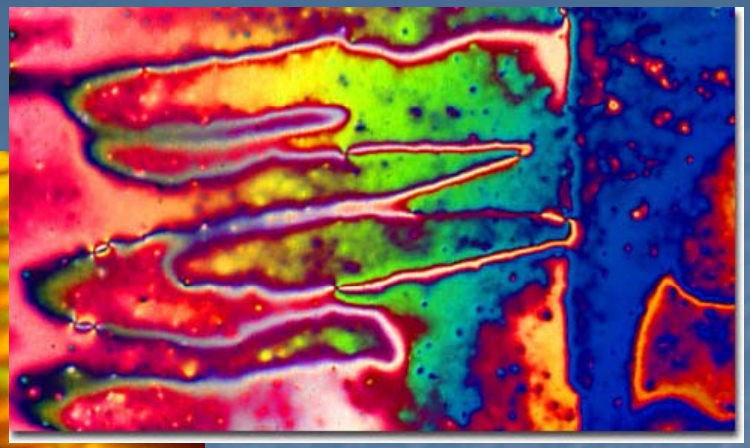
After laying out everything they had in the car, including tent, etc., in front of Dorothy's they bundled everything so that it would fit on the bus.

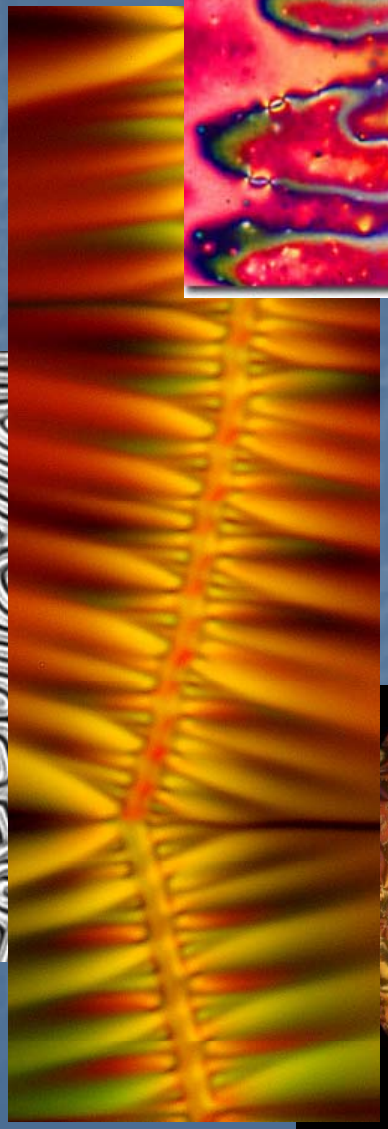
As they climbed aboard the bus to Ft. Collins, Colo. they vowed that all of this still wasn't going to spoil their trip, as they were going to stop at the Grand Canyon and anything else that struck their fancy.

"HAPPY WANDERERS" — left to right: Fernando Martinez, Luis Lopez, and Jose Martin-Pereda!

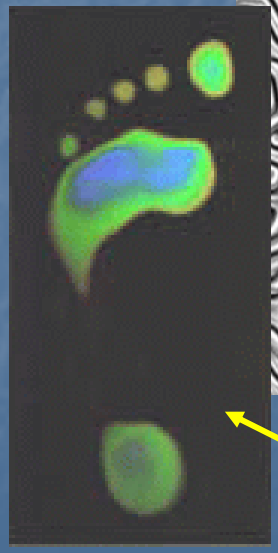
Planning Commission



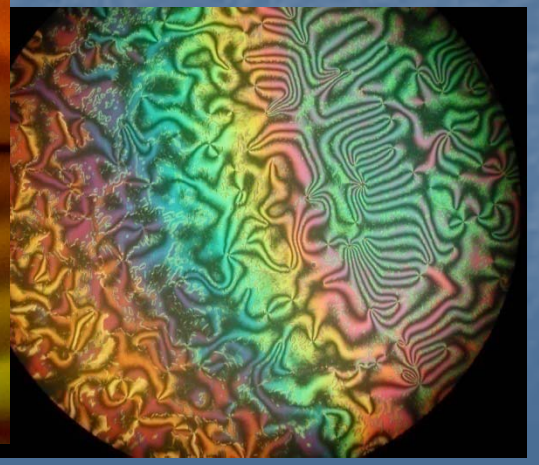


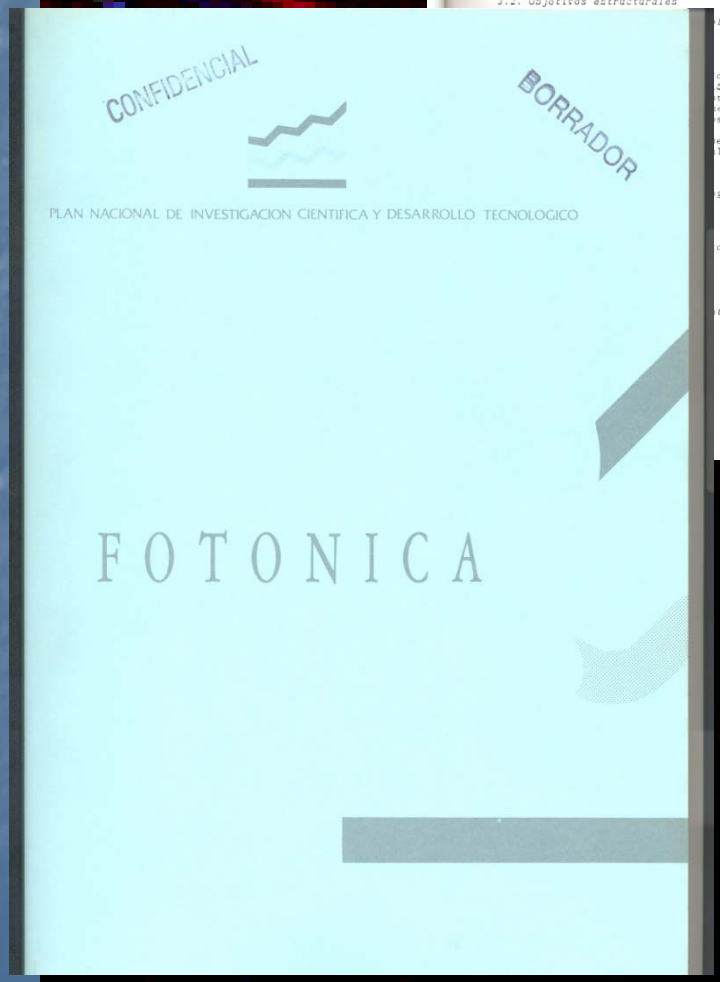


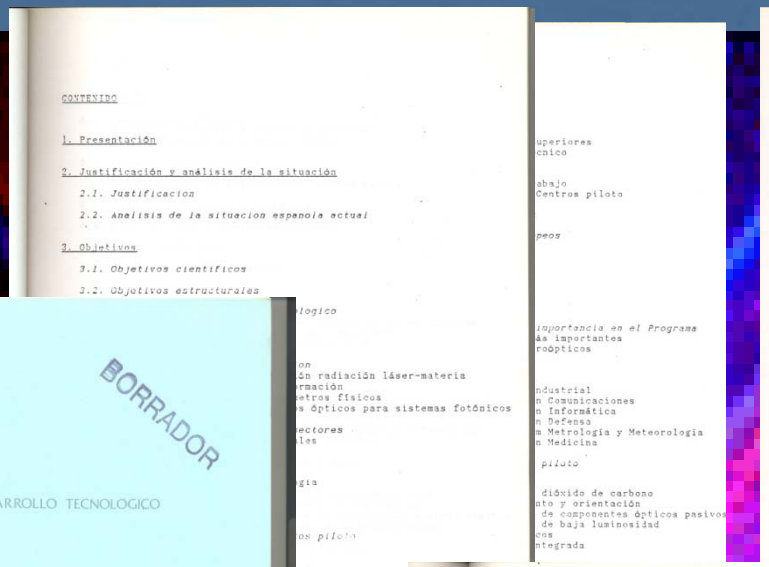
Diferentes tipos de texturas en algunos cristales líquidos



Medición de temperatura con C.L. colestérico






CONTENIDO

1. Presentación

2. Justificación y análisis de la situación

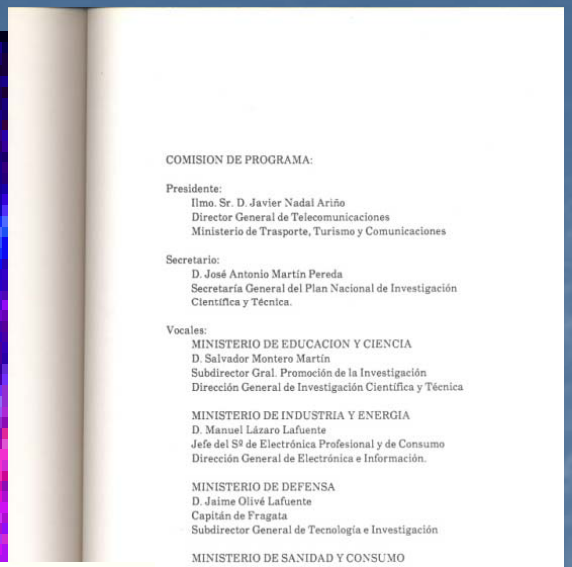
2.1. Justificacion

2.2. Analisis de la situacion espanola actual

3. Objetivos

3.1. Objetivos cientificos

3.2. Objetivos estructurales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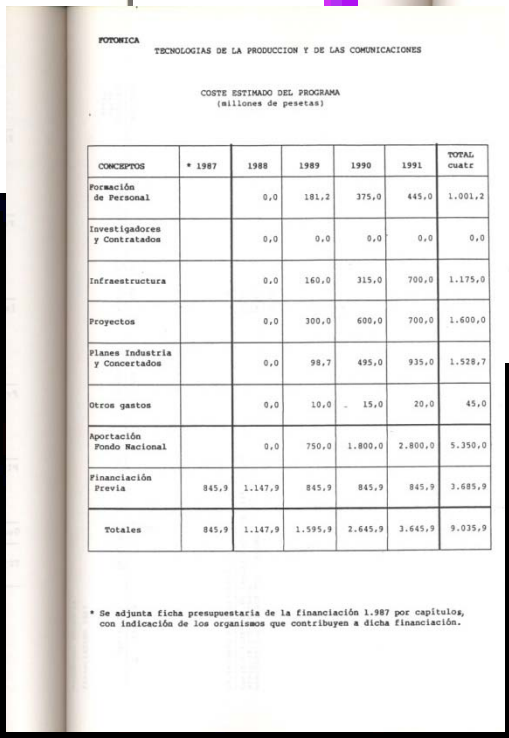

FOTONICA

TECNOLOGIAS DE LA PRODUCCION Y DE LAS COMUNICACIONES

COSTE ESTIMADO DEL PROGRAMA
(millones de pesetas)

CONCEPTOS	* 1987	1988	1989	1990	1991	TOTAL cuatr
Formación de Personal		0,0	181,2	375,0	445,0	1.001,2
Investigadores y Contratados		0,0	0,0	0,0	0,0	0,0
Infraestructura		0,0	160,0	315,0	700,0	1.175,0
Proyectos		0,0	300,0	600,0	700,0	1.600,0
Planes Industria y Concertados		0,0	98,7	495,0	935,0	1.528,7
Otros gastos		0,0	10,0	15,0	20,0	45,0
Aportación Fondo Nacional		0,0	750,0	1.800,0	2.800,0	5.350,0
Financiación Previa	845,9	1.147,9	845,9	845,9	845,9	3.685,9
Totales	845,9	1.147,9	1.595,9	2.645,9	3.645,9	9.035,9

* Se adjunta ficha presupuestaria de la financiación 1.987 por capítulos, con indicación de los organismos que contribuyen a dicha financiación.

Programa nonato Nacional de FOTONICA 1987

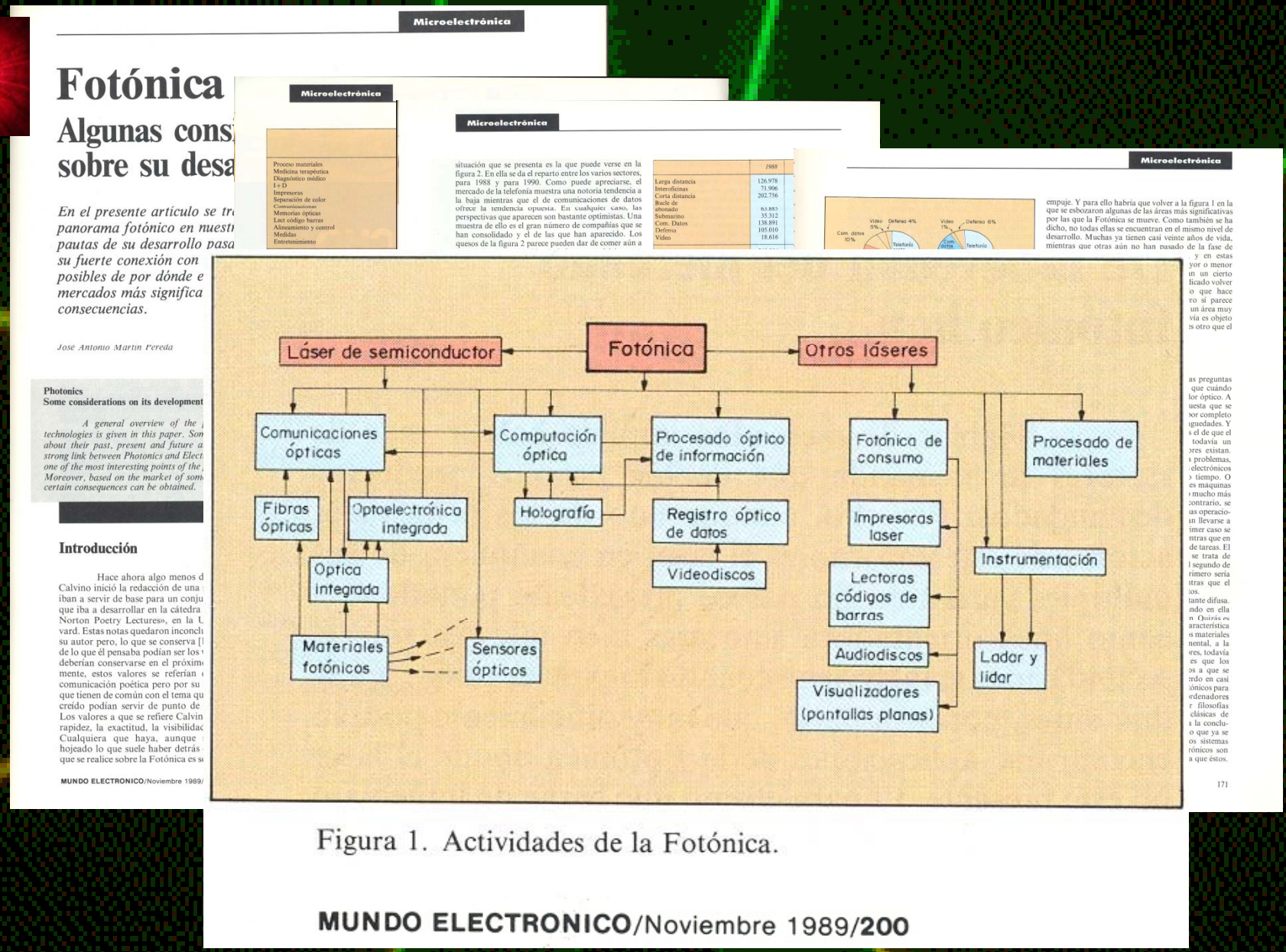
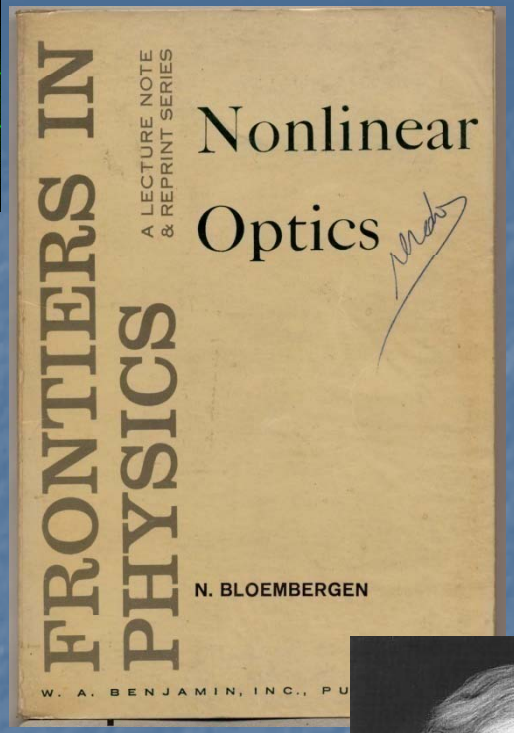
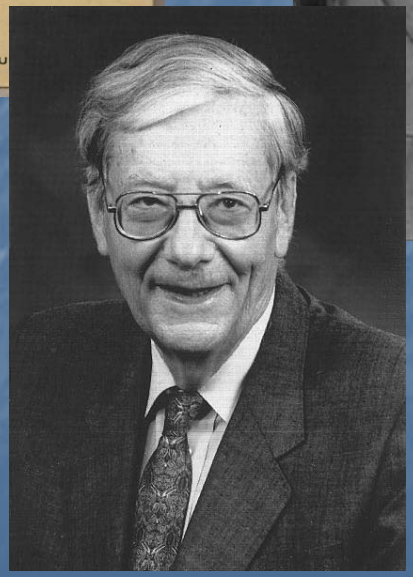
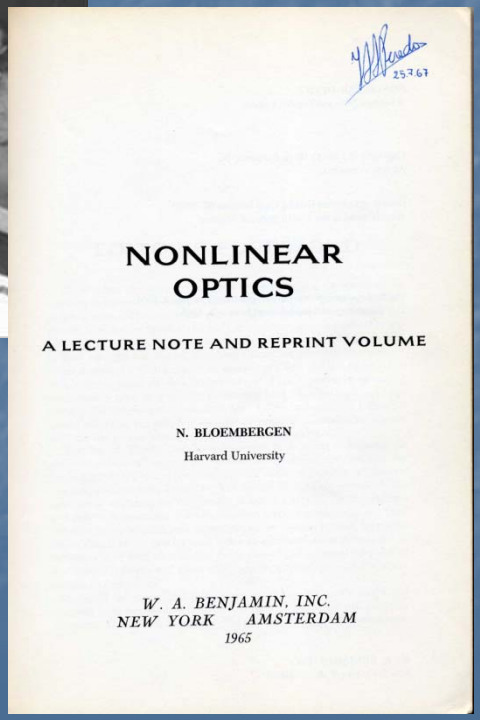


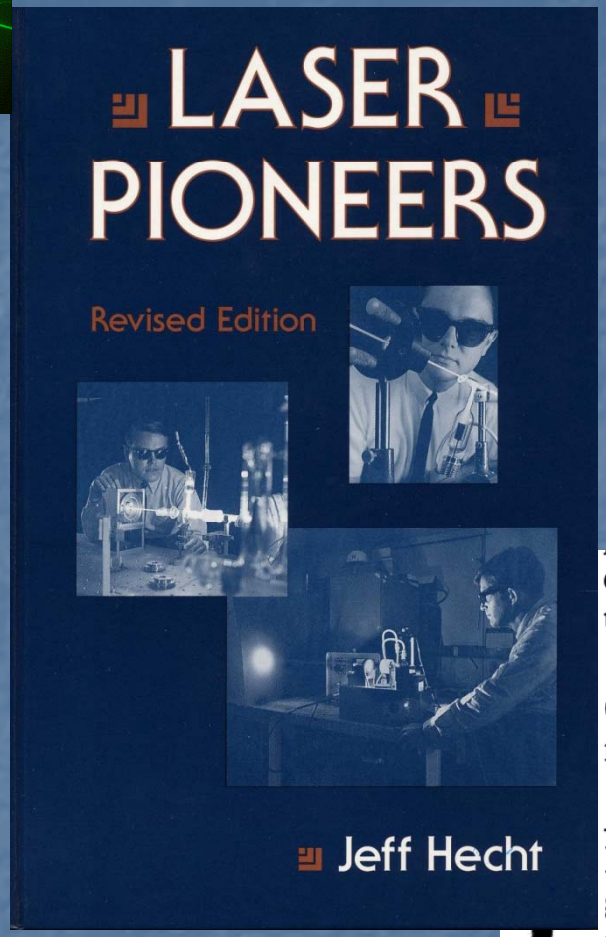
Figura 1. Actividades de la Fotónica.



November 1, 1958







NICOLAAS BLOEMBERGEN

Masers and Nonlinear Optics

Born in Dordrecht, the Netherlands, in 1920, Nicolaas Bloembergen came to Harvard University after World War II to complete his doctoral thesis research on nuclear magnetic resonance. He joined the Harvard faculty in 1951 and was named Gordon McKay Professor of Applied Physics in 1957. He later became the Rumford Professor of Physics, and in 1980 he was named Gerhard Gade University Professor at Harvard. He became Professor Emeritus in 1990.

In the 1950s Bloembergen pioneered development of the three-level solid-state maser. After the laser was developed, his research interests turn to nonlinear optics. His theoretical work, which laid the groundwork for the field, was first published in the early 1960s and summarized in his 1965 book, *Nonlinear Optics*. That work on nonlinear interactions also led to development of techniques for extremely high resolution laser spectroscopy. He received the 1981

developments by participating in conferences and by finding time to catch up with the research literature.

Q: If you had it to do all over again, would you still work in this field?

Bloembergen: Yes, it has been a good field, a very fruitful field. But my answer would be different if I were to start out as a young graduate student now. I wouldn't go into it because the field has matured. I probably would go into biophysics and biochemistry, because there you can still do some relatively small-scale experiments. If you are clever in your experimental techniques and understand the field, you can do some really clever things quickly in a small group.

Sols sé que miro el riu

al llarg de la ribera;

i sempre sóc el punt

on l'aigua fa el seu pur

començament de perdre's.

CARLES RIBA