

06/08/2001

World's tiniest laser created

WASHINGTON (AP) — Researchers at the University of California, Berkeley, have made the world's smallest laser, a nanolaser on a nanowire that is a thousand times thinner than a human hair.

In a report appearing Friday in the journal *Science*, the Berkeley researchers report that the tiny laser emits ultraviolet light and can be tuned from blue to deep ultraviolet.

The researchers made the laser of pure zinc oxide crystals using a standard technique called epitaxy. This involves immersing a device in hot vapor, which is deposited as crystals in a very thin layer, often only a few molecules thick.

Los Angeles Times

Thursday, June 7, 2001

Researchers Make Smallest Laser

WASHINGTON — Researchers at the University of California, Berkeley, have made the world's smallest laser, a nanolaser on a nanowire that is a thousand times thinner than a human hair.

San Francisco Chronicle

Monday, June 11, 2001

Berkeley Scientists Create Smallest Laser

Researchers at the University of California at Berkeley have made the world's Smallest laser, a nanolaser on a nanowire that is a thousand times thinner than a human hair. In a report appearing in the current issue of the journal *Science*, the Berkeley researchers report that the tiny laser emits ultraviolet light and can be tuned from blue to deep ultraviolet.

THE DAILY CALIFORNIAN

Tuesday, June 12, 2001

Nanolaser May Lead to New Breakthroughs

UC Berkeley scientists have unveiled the world's smallest laser, made from lab-grown tubes thousands of times thinner than a human hair and packing more than 100 times more information than conventional lasers.

The invention has enormous implications for the computing industry, as the smaller high-energy lasers could lead to the development of smaller, cheaper and faster technology.

A team of scientists from the university's Lawrence Berkeley National Laboratory developed the new technology that could lead to compact discs with a memory capacity of hundreds, if not thousands, of times more information, said Samuel Mao, one of the scientists specializing in lasers who worked on the invention.



World's Smallest Laser Created in Berkeley

It's 1,000 times thinner than a human hair and stands to significantly advance the field of miniature electronics.

A tiny laser unveiled by a University of California, Berkeley chemistry professor and four Lawrence Berkeley National Laboratory scientists could mean big things in the field of miniature electronics.

As reported in the research journal *Science*, the Berkeley scientists used miniature tubes that are 1,000 times thinner than a human hair to create the world's smallest laser. It is 100 times smaller than the previous record holder.

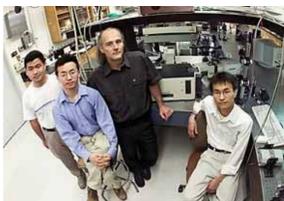
Smaller usually translates into cheaper costs and increased energy efficiency in nanotechnology, the science of building small structures molecule by molecule. Future advances are expected to include denser information storage.



Lilliputian Laser: One-Thousandth The Diameter Of A Human Hair

One of the smallest lasers ever made -- far too small to be seen even with the aid of the most powerful optical microscope -- has been successfully tested by a team of researchers with Lawrence Berkeley National Laboratory (Berkeley Lab) and the University of California at Berkeley. This device, which emits flashes of ultraviolet light, is called a "nanowire nanolaser" and it measures just under 100 nanometers in diameter or about one ten-millionth of an inch.

The nanowire nanolasers are pure crystals of zinc oxide that grow vertically in aligned arrays like the bristles on a brush. These crystal wire "bristles" range from two to 10 microns in length, depending upon how long the growth process was allowed to proceed. By comparison, the tiniest solid-state lasers in use today are fashioned from thin films of either gallium arsenide or gallium nitride and generally run several microns thick, or about one hundred thousandths of an inch. A typical human hair is about 100 microns thick.



PICTURED (LEFT TO RIGHT) ARE RESEARCHERS HAOQUAN YAN, SAMUEL MAO, RICHARD RUSSO, AND PEIDONG YANG

Plus petit pour faire plus grand

Des chercheurs de l'Université Berkeley de Californie viennent de fabriquer le plus petit laser de la planète, sur un mini fil mille fois plus petit qu'un cheveu humain. Ce "nanolaser" constitué d'oxyde de cristal de zinc pur, à partir d'une technique simple d'épitaxie (orientation mutuelle des cristaux de matière), émet des rayons allant du bleu pâle au violet foncé. Si les chercheurs réussissent (et c'est bien parti) à le faire fonctionner avec du courant électrique normal, il pourrait alors être utilisé dans les circuits électroniques des appareils d'identification de composants chimiques ou pour augmenter la capacité des disques durs.

Berliner Zeitung

Datum: 13.06.2001

Am Rande des Regenbogens

Forscher arbeiten an neuen ultravioletten Lasern. Ihr kurzweiliges Licht schafft auf CDs mehr Speicherplatz.

Franfurter Allgemeine

13.06.2001

Ein Laser aus Nanoröhrchen

Wie Grashalme stehen diese winzigen, weniger als 100 Nanometer dicken Kristallnadeln nebeneinander. Es ist, als hätte sie jemand mit dem Rasenmäher abgeschnitten. Etwa zehn Milliarden von ihnen bedecken eine Fläche von einem Quadratzentimeter. Sie alle bestehen aus dem Halbleiter Zinkoxyd und sind gleichsam Miniaturlaser. Werden die Kristalle mit ultraviolettem Licht beleuchtet, strahlen sie Laserlicht bei der Wellenlänge von 380 Nanometer ab ("Science", Bd. 292, S. 1897).

AUSTRALIAN

19 June 2001

Smallest laser created

RESEARCHERS at the University of California, Berkeley, have made the world's smallest laser, a nanolaser on a nanowire that is 1000 times thinner than a human hair.



Friday, June 8, 2001

Researchers make world's smallest laser

WASHINGTON (AP) -- Researchers at the University of California, Berkeley, have made the world's smallest laser, a nanolaser on a nanowire that is a thousand times thinner than a human hair.



2001-06-10

美研制出世界上最小的激光器

美國加利福尼亞大學伯克利分校的研究人員在只及人類頭髮絲千分之一的納米導線上製造出了世界上最小的激光器——納米激光器。這種激光器不僅能發射紫外光，經過調整後還能發射從藍色到深紫外的光。

indiatimes news THE TIMES OF INDIA

9 June 2001

Researchers make smallest laser

WASHINGTON: Researchers at the University of California, Berkeley, have made the world's smallest laser, a nanolaser on a nanowire that is a thousand times thinner than a human hair.



Najmenši laser je 1000-krát tenši ako ľudský vlas

Chemikovi kalifornskej univerzity v Berkeley sa podarilo vyrobiť najmenší laser na svete – nanodrôtik, nanolaser tisíckrát tenší ako ľudský vlas.



Creto un nanolaser dal raggio migliaia di volte più sottile di un capello

14 giugno 2001

In epoca di nanotecnologie (la vera ricchezza tecnologica del futuro almeno per quei Paesi come Stati Uniti e Germania che già da una decina d'anni stanno conducendo ricerche) è stato sviluppato dagli scienziati dell'Università della California un nanolaser capace di produrre un raggio migliaia di volte più sottile di un capello. La notizia, riportata dal sito Le Scienze, riguarda un dispositivo che ha molteplici funzioni in molti campi, tra cui le analisi chimiche, la memorizzazione ad alta densità delle informazioni e la fotonica, la trasmissione delle informazioni tramite la luce.



07/06/2001

Ultraviolette nanolasers

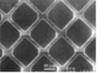
Berkeley, California (VS) - Met nanodraden van zinkoxide fabriceerden Californische onderzoekers ultravioletlasers die werken bij kamertemperatuur. Voor optische computers en communicatiedoelinden vormt deze ontdekking een belangrijke doorbraak.

De golfengte van halfgeleiderlasers is de laatste jaren steeds toegenomen. De stap van de rode laser in een cd-speler tot de recente blauwe lasers was al erg groot. Inmiddels zijn er lasers die bij kamertemperatuur groenblauw licht uitstralen, gebaseerd op zinkseleen en indiumgalliumstikstof.

June 11, 2001

Nanolaser Tag

Zap! Scientists create the world's smallest ultraviolet laser.



Using forests of tiny nanowires, researchers at the University of California at Berkeley have built a nanolaser that emits ultraviolet light—the smallest UV laser ever.

The tiny laser could have a wide range of applications, from optical computing—where information travels at the speed of light—to data storage, where low-wavelength UV lasers could pack four times as much information on a CD as the red lasers used today. Further applications include super-high resolution laser printers and laser-powered biochips.



AMERICAN INSTITUTE OF PHYSICS

October 2001

Ultraviolet nanolasers

With blue diode lasers moving rapidly toward mass production, researchers have naturally turned to the development of ultraviolet (uv) diode lasers. Such lasers would have the same advantages as did previous moves to shorter wavelengths: the shorter the wavelength, the more data one can pack in a given area of an optical disk. But it has not been obvious what material would be suitable for such lasers. Now researchers from Lawrence Berkeley National Laboratory and the University of California, Berkeley, have demonstrated uv lasing in zinc oxide (ZnO) nanowire arrays, in which each nanowire is only 20 to 150 nm in diameter.



UP

Ultraviolet light to squeeze in the data

[7 Jun 2001] CDs and DVDs could soon be able to hold much more data thanks to two new devices created by American and Japanese scientists.



Friday, June 8, 2001

WIRED FOR LASING

Nanowires Produce Ultraviolet Laser Light At Room Temperature

A team of scientists at the University of California, Berkeley, and Lawrence Berkeley National Laboratory (LBNL) has developed nanowires that can be used as ultraviolet lasers [*Science*, 292, 1897 (2001)].



7 June 2001

Crystal nanowires cultivate lasers

US scientists have coaxed ultraviolet lasers from zinc oxide nanowires

Scientists at the US University of California at Berkeley have demonstrated mirrorless, ultraviolet lasing in zinc oxide semiconductor nanowires at room temperature. By persuading whisker-sized crystals to grow on a sapphire substrate, the scientists believe that they have created an ideal miniaturized laser light source that could find use in optical computing and information storage.



Fall 2001, Volume 11, Number 3

World's Smallest Laser

A research team from the University of California/Berkeley and Lawrence Berkeley National Laboratory has grown the world's smallest laser — a nanowire nanolaser one thousand times thinner than a human hair.



June 9, 2001

UC Berkeley Researchers Make Smallest Laser 1,000 Times Thinner Than A Human Hair

Researchers at the University of California, Berkeley, have made the world's smallest laser, a nanolaser on a nanowire that is a thousand times thinner than a human hair. In a report appearing Friday in the journal *Science*, the Berkeley researchers report that the tiny laser emits ultraviolet light and can be tuned from blue to deep ultraviolet.



BERKELEY, Calif., June 7

Researchers claim to grow smallest laser

Researchers in California say they have created the world's smallest laser, a nanolaser a thousand times thinner than a human hair.



Friday June 08, 2001

Berkeley unveils tiny laser

A team of UC Berkeley chemists has created the world's smallest laser from miniature tubes 1,000 times thinner than a human hair.



September 2001

Nanowires Produce Laser Light

Researchers at the University of California and Lawrence Berkeley National Laboratory in Berkeley, Calif., have developed a 385-nm laser based on nanowires of zinc oxide. If the optically pumped devices can be made to operate by electrical pumping, they may offer applications in optical computing, lab-on-a-chip analysis and information storage. The researchers produced the arrays of 20- to 150-nm-diameter hexagonal nanowires, which look like the bristles on a hairbrush, using an epitaxial growth process on sapphire crystals that they had patterned with a gold film. A visible laser served as the pump source. They reported their results in the June 8 issue of *Science*.