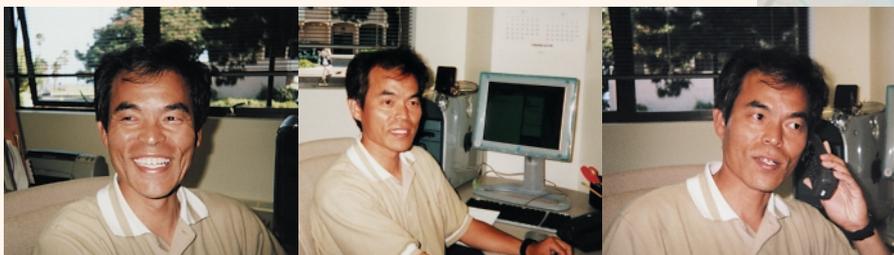


Interview

'Why I decided to leave Nichia for the American Dream'

Professor Shuji Nakamura, University of California, Santa Barbara, U.S.A

Interviewer: Yasuhiko Arakawa, JSAPI Editor in Chief



Professor Shuji Nakamura is internationally acknowledged as having developed the world's first commercial GaN-type blue LED at Nichia Chemical Industries Ltd. ('Nichia'). His innovations have created new industries working on either the direct manufacture of violet/blue/green LEDs and laser diodes or enterprises involved in their applications for products such as DVD's and white lighting. Professor Nakamura could be described as one of the pioneers, including Professors Akasaki, Meijo University, of the modern day 'blue period' and his ingenuity will have an effect on millions of people worldwide.

Towards the end of 1999, Professor Nakamura surprised many of us when he announced that he was resigning from Nichia (where he had worked for 20 year) and would be joining University of California at Santa Barbara as a faculty member. The sudden transition from a Japanese company to a university in the United States was totally unexpected and was big news in both Japan and overseas.

Professor Nakamura authored an excellent review article on blue lasers and LEDs, for the inaugural issue of JSAPI in January 2000. For this second issue of JSAPI, the editorial committee decided to interview Professor Nakamura to enquire why he decided to go to UCSB and his plans for the future. Therefore, recently, when I had an opportunity to go to the US, I also visited him at UCSB and interviewed him for this issue of JSAPI. The conversation focused

on the reasons why Professor Nakamura decided to resign from Nichia and some of his plans and directions for the future as an academic at UCSB, rather than the technical aspect of his work. I think that his comments and opinions about industry, education and science contain valuable advice that should be particularly noteworthy for many of our readers, especially younger researchers and students in Japan.

Yasuhiko Arakawa
JSAPI Editor in Chief

Why I left Nichia

Arakawa: I would like to start by asking why you decided to resign your position at Nichia? Also why America and academia as opposed to industry?

Nakamura: I would like to start with your first question and why I quit my company. I have been working on the development of blue LED's since 1989. Most of the development work on white light illumination using LED's and related technology was pretty much finished by 1995 or 1996. After that, I worked on laser related products and that work was finished around October last year (2000); the 5-mW laser was anyway. So now Nichia has the technology to produce higher-wattage lasers although they are not yet commercial products. So, as far as development is concerned, there was not much

more left to be done. Of course, there is still some effort required to make these new technologies into commercial products, but as far as development is concerned, it's pretty much been completed. Nichia will expand and benefit greatly from manufacturing these new products. So one of the reasons I decided to quit was the fact that the development had been completed and I had fulfilled my role within the company.

Another reason was that in Japanese companies, no matter what you have accomplished neither your position nor your salary change very much. Not just my previous company, but other companies as well. Perhaps there are one million-yen bonuses (around \$10,000) given to people, but that's about it. The workers are all treated more or less the same.

I have attended many conferences in the US. Quite often I was told by local scientists and engineers attending such meetings that in the US if someone developed technology that led to significant profits for the company then that person would be treated like a "superstar". There is little or no incentive to work harder or be creative. Everyone is equal which in one sense can be good but in another sense it can be bad for highly motivated people. The basic principles of competition are lost.

Arakawa: So you think there are problems with the process of evaluation in Japan?

Nakamura: Yes. The reason that Japan's industrial working practices have not changed is because able and talented people do not quit and move on. I worked at Nichia for 20 years, without ever thinking of quitting. Top-class sports people get raises if they threaten to quit because their managers want to keep them. That's how it should work. You see my generation grew up being taught that you should stay with one company all your life. We were led to think that quitting a company was a bad thing. We believed it. But just look around today. More people are beginning to doubt this way of thinking. I think that more people should consider resigning so that management can see the real value of talented people.

Arakawa: I have the impression that large Japanese corporations follow this kind of

traditional management system, although recently, some are trying to change. But I would have thought that Nichia, which could be classified as a small-medium sized venture minded company, would have treated you very well. Was this not the case?

Nakamura: No. I realized that the treatment was not good at all, especially since coming to Santa Barbara. It's very different. In Japan the management system is not designed to 'manage' scientists and engineers who excel in their work. But Nichia, in that sense, is still a very traditionally Japanese company. I don't think it will be possible for it to change soon.

Arakawa: In Japan, it is often said that because of the potential prospect of an eventual promotion, you should not expect short-term rewards or raises. The time constant is can be long and a promotion is often based on not just one accomplishment but on the integrated effort expended over a given period of time. It can be a long process. Of course, such systems are in modern-day seriously examined and will be certainly changed.

Nakamura: Well, it's long... it may be too long.

Arakawa: What was Nichia's reaction when you announced your resignation? Did they ask you to stay or reconsider your decision?

Nakamura: No. I had kept my resignation a secret the entire time. I gave in my resignation on the same day as I quit. It was very sudden.

Arakawa: So you didn't give them time to say anything?

Nakamura: Right, I just quit and left. I didn't even give them a chance to say anything.

Why I went to university

Nakamura: Now, I would like to try to answer your next question about coming to America. As I said before, I think that the Japanese system is a less competitive system. But in the U.S., there is the idea of the "American dream." You can give it a try, and you may achieve it. In Japan, it is totally impossible, with a success rate of virtually zero. But in America, about 10% succeed with venture-type businesses.

Actually, I wanted to work for a company in

America, too. I received all kinds of offers; some with very good salaries. Initially I didn't want to join a university. I did not consider myself as being an educator. I am a company man. In a company, you should be able to make it based on your ability. But all the companies that approached me were competitors to my former employer, and there is always the problem of patents and other legal issues involving confidentiality. Also, my potential work at another company would probably have been similar to that I did at Nichia. That's why I decided to join a university. I did not want to create unnecessary problems. I believe that if a company man wants to change jobs, it's better to go to a university; it's the safest place. Well, actually with most companies it may not be a problem, but if a patent is involved, a college is the best place to move to.

How I feel now in US

Arakawa: Now that a few months have passed since coming to Santa Barbara, what do you think about your move?

Nakamura: I am very glad that I quit and moved here. There is absolutely no question about this. I still cannot believe that I was with that company for 20 years! There is a definite sense of freedom. I am busy-very busy indeed. But still I feel free working here. There is no boss and I can do what I want to do. Of course, my salary now is better than what I used to get from my former company. If a university here pays me more than my former industrial employer, you can imagine how much U.S. companies were offering me.

Arakawa: Was your pay at Nichia not good?

Nakamura: It was the standard income for the middle-management level in a large Japanese corporation, perhaps. But the main difference is the level of freedom I have here. Sure, I'm very busy-maybe busier than I was before. In fact, starting next academic year, I have to teach! The lectures will keep

me busy.

Arakawa: Yes, lectures can take up a lot of time especially the first time around, although, of course, university teaching does have its rewards.

Nakamura: Yes, I am a bit concerned about that, too.

My future plan

Arakawa: I would like to move onto another aspect of your work. You have earned fame by developing blue LED. Now that you are here, what kind of research are you planning to do? What are your future plans?

Nakamura: Well, first, in America, you must gather your own funding for research. You get paid for only 9 months, and you cannot even hire students if you don't bring in money. So I will need to get some funding first. So that's my first task. Later, when I am more comfortable with the language and with the country and its culture, I will probably start something new. I don't know what it will be yet, but I will do something. At the moment everything is new to me; the country, the academic environment, everything.

Arakawa: Do you plan to still continue work on LEDs and lasers for foreseeable future?

Nakamura: Well, I may want to move onto different things; high power electronic devices, for example.

Arakawa: In the US, it is quite common for professors actively working in the field of engineering to start their own company. Are you thinking of doing so?

Nakamura: Well, I am not really thinking in that direction right now. Also, if you work



Center: Prof. Nakamura, Right: Prof. Arakawa

for a company, there is always the issue of terms and conditions. Every company requires terms, and if you have to deal with ten companies, you'll just die. So you get money, but in exchange you need to accept

their terms. I wish I could get money without any conditions. But that won't happen. So at the moment, I am not thinking in terms of setting up a company.

Arakawa: Yes, I suppose your priority will be more freedom.

Nakamura: Right. At the moment, I am thinking of doing work without companies rather than with them.

People should move in Japan

Arakawa: Can we change the topic again and ask you what you think about Japanese universities and companies in general?

Nakamura: Again, as you can see from the fact that I quit, Japanese companies do not provide an environment conducive for highly motivated researchers. There are incompetent people who cannot do anything and there are others who excel, but everyone is given the same treatment. Why? I believe it's because such good people do not quit. I also think I made some mistakes. When I was writing all those patents for the company, I was thinking only about the company. I should have thought about quitting earlier and not have written all those patents that helped the company get rich. In Japan, you are supposed to dedicate yourself to the company. That's what we were taught. That's the only way we thought. I think that you need to think of yourself. You don't have to think of your loyalty only. That's not the thing to do anymore. Treatment will not improve until people quit like in baseball or soccer.

As for Japanese universities, well, I'd better be careful now since I am with a university now, but I feel that Japanese academics really do not know the outside world, or society. Universities and companies are not good at communicating; the means of interfacing is not good. Universities do not compete in Japan. But here in the U.S., many professors start their own companies. In Japan, the only thing you see occasionally is some company person moving into universities. In the U.S., a lot of venture companies are located close to major universities. The Japanese system should allow professors to go into business and earn more.

Arakawa: That's very true. When we begin

a project, we should always think of the effect of the project on society including the economic aspects because basic research in a totally unrelated, unused area is very meaningless in the field of applied physics. I think that in the future, academics in Japan should actively enter the corporate environment and work together with companies.

Nakamura: Yes, in the US, the motivated academics involved in business are living in huge mansions. But such professors could never afford such houses with only their college salary. So people have a strong motivation to start a business. And sometimes they make one of their students the president of their company. These students work hard and achieve their American Dream.

American schools and students

Arakawa: I know that only a few months have passed since you arrived in California but what do you think of American universities and American students in particular?

Nakamura: Well, I have seen that American students are very diligent and highly motivated. They work around the clock; almost 24 hours. Of course, the fact is that they don't graduate unless they produce some significant work. If they don't perform well, then they don't finish and cannot graduate. In Japan, most people can graduate even with mediocre work. It's difficult to graduate here, so they are motivated to produce good work. That's one of the major differences. In Japan, universities are hard to enter but easy to graduate. In America, it's the opposite. Easy to get in, hard to get out. Students are very motivated once they get in.

Arakawa: Yes, exit management is really important. That needs to be changed in Japan.

Nakamura: Right. Of course, another difference is that in the U.S., the best students go into venture companies. That's very important, making it possible for them to achieve the American Dream. They become very rich. It is possible for them to join such venture businesses. I cannot understand what's so good about big companies? You may make a hundred thousand dollars a year, but then that's about as high as you go.

Some of these very successful people are in their twenties and they have seen it happen to others. The best students here start their own companies or join venture companies. In Japan, this is not possible yet. The students here are very motivated as students because they know that this is a possibility. In Japan, most students' biggest dream is to join a big company. You work as a life-long 'salary-man', and then retire. That's the difference.

Arakawa: Of course, things are changing in Japan, since large companies are laying off employees because of restructuring and downsizing. And of course, parents too need to change their mindset: they are often the ones who want their kids to enter prestigious companies.

Nakamura: That's right.

Message to students

Arakawa: I think the situation is going to change in Japan over the next few years. Finally, do you have a message for students in Japan, America and all over the world?

Nakamura: Well, I would just say that you should keep striving to realise your dream. In America it's called the American Dream. Japanese students should also be aware of this possibility. The whole structure of Japan must change. If they can only change their way of thinking it is possible to make a change. Success is possible. There are the inevitable failures. Even in America, 90% of the people starting out venture companies fail. But they don't leave any debts. The venture capital invested is gone, but that's it. No negative image remains. But in Japan, if you fail in a venture business, you will have a huge debt, and a strong negative image is attached to you for the rest of your life. But here, you don't have that. New inventions and innovations are only possible with new ventures.

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