

Title	Thorough pursuit of your target theme will reveal true fun of learning : Listening to what Associate Professor Yukio Nozaki has to say
Sub Title	
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Publisher	Faculty of Science and Technology, Keio University
Publication year	2012
Jtitle	New Kyurizukai No.10 (2012. 7) ,p.4- 5
JaLC DOI	
Abstract	
Notes	Interview
Genre	Article
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO50001003-00000010-0004

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Thorough pursuit of your target theme will reveal true fun of learning

Mr. Nozaki says that in his high school days he liked chemistry more than physics. But as a university student he studied under Professor Miyajima and associated with physics-minded friends and overseas researchers, which awakened his interest in physics. His interest in physics continues to grow even today. Especially, standing in front of his students in the classroom as a teacher gives him an impetus, making him more and more aware of the depth of this area of learning. His students are attached to and respect Mr. Nozaki as a strict yet gentle teacher.

As a small child was there anything special you were crazy about?

According to my mother, I was a child who liked disassembling mechanical things. Since my parents were self-employed, they were usually away from home most of the day. And also because I was an only child, I used to play alone. One day, mother returned home and found me disassembling a camera.

If I remember correctly, I wanted to know about the camera's mechanism rather than simply disassembling the camera for fun. Yes, I remember I was curious about what kind of mechanism makes it possible to take photos, and why the camera makes a click when the shutter is pushed. These questions were wonders and caught my interest. Presumably, the camera's back cover might have come off as I repeatedly opened and closed it in an attempt to look inside – the beginning of disassembly. By the time mother came back home, the camera might have been reduced to screws, parts and so on. I was bitterly scolded.

Because of all these events, it seems to me that mother found me definitely suitable for science and technology. Then she switched her policy: instead of things being disassembled, she gave me plastic model toys, which allowed me not only to disassemble but also reassemble them. From this time on, I also became interested in making things.

Did you like scientific subjects at school as well?

I wonder. Rather than love of scientific subjects, what occurred to me above all else was awareness of my weakness or dislike of liberal arts-oriented subjects. I liked mathematics and science because I could think and work out answers on the spot. But I was poor in subjects that require day-after-day constant learning (particularly by rote). My performance in writing kanji characters to dictation was truly miserable! Although I could somehow manage these subjects by last minute cramming for examinations

up to the end of junior high school, such a makeshift technique didn't work at all in senior high school. Naturally I stayed away from liberal arts subjects and set my mind toward scientific subjects like mathematics and chemistry. But physics was an exception. Back in those days, physics was a subject totally lacking a sense of reality (as it seemed to me). I could little appreciate the true fun of physics.

By contrast, in chemistry, you can reenact a reaction before your eyes if you combine chemicals just as described in the chemical formula in question. It seemed to me chemistry is more realistic or interesting.

You mean chemistry is more interesting as it can explain the realistic world?

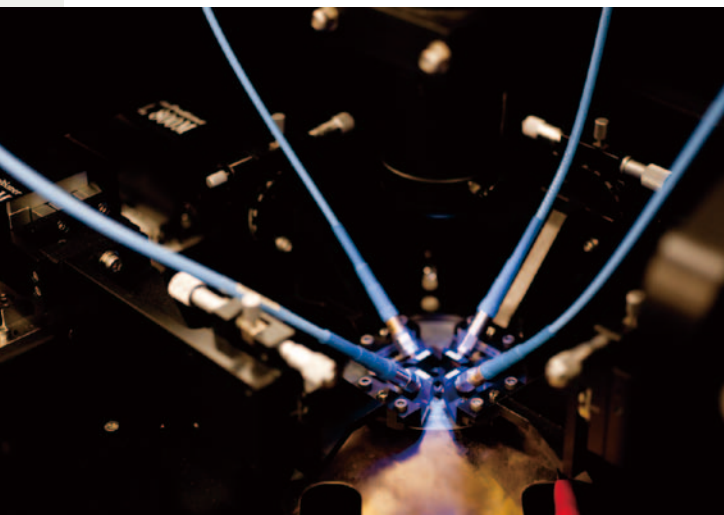
Well, compared with physics that seems somewhat disconnected from reality, chemistry appeared to be simple and straightforward, allowing the cause and effect to be directly connected. This is why I was attracted more to chemistry in high school. Chemistry even appeared to me as approaching straight into the essence of things.

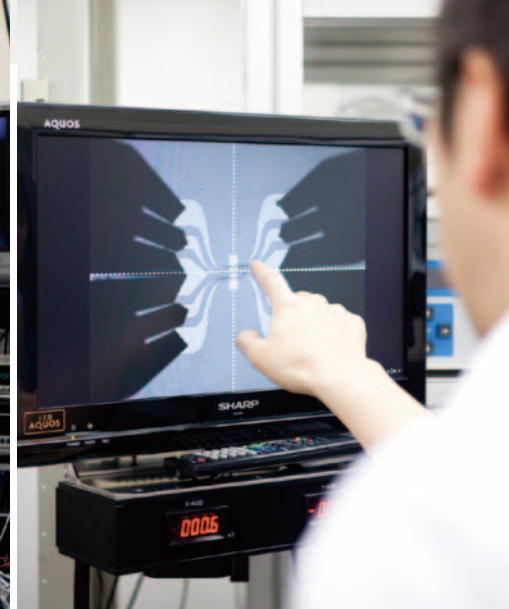
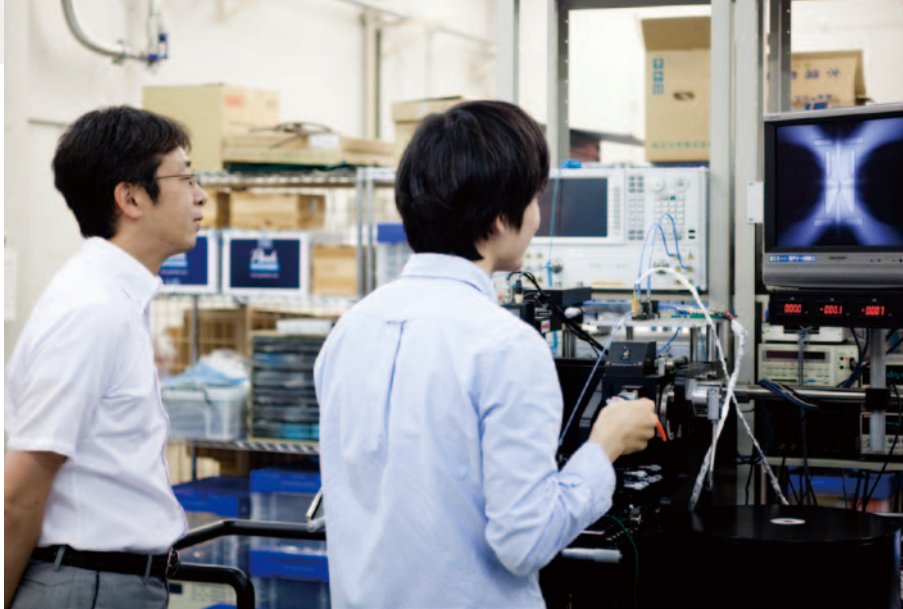
To tell the truth, I became aware of the fun of physics only after I was admitted to Keio University. The impetus was a friend I became acquainted with on campus. I was influenced by him stressing that physics is excitingly interesting and pursuits other than physics are not worthy of learning. At that time I thought I would keep physics as one of my options. What determined my course of life was a class on electrodynamics by Dr. Hideki Miyajima (now Prof. Emeritus). Dr. Miyajima's teaching was free of unreality – it was easy to understand and interesting, which made me think that physics might be fun to study. It was when I was a sophomore. Frankly speaking, I wish I became aware of this a little earlier.

About when did you make up your mind to choose a researcher career?

I became serious about becoming a researcher after I belonged to Dr. Miyajima's lab and began to study in the master's course. When I was looking for a research theme, a research associate of our lab, who was about to visit France for research purposes during the summer holidays, happened to be looking for a student who would accompany to assist him. I raised my hand the moment I heard of this offer. Since nobody else volunteered to do so, my visit to France was decided.

Through the two-month period of devoted research work in a foreign country like France and surrounded by highly motivated foreign researchers, I became aware of the delight of concentrated





research. I found research activity exciting enough even for an assistant like myself. Then how wonderful would it be if the research work were for my own sake? This was my impression, which urged me to choose a researcher career.

Is distinction between research and your private life difficult?

Before marriage, research work was everything in my life. But after I got married, I changed my lifestyle and became able to distinguish my private life from research work, especially with the birth of my first child. Because preparing for lectures for the following day is demanding and time-consuming, I sometimes have to do it at home. But I completely enjoy private time when communicating with my children. In fact, dealing with children is a great task itself and my hands are full. Frankly speaking, physics is the last thing I can think of. I have little idea of what my children are thinking of, and their thinking is not logical at all. But their pointlessness and unmanageable behavior are fun, maybe. For sure, children are a matter of greatest interest for me.

What do you want your students to learn?

As advice based on my own experience, I'd like my students to identify a research theme they find intriguing. The field doesn't matter. If there are some who have already identified their themes, they should proceed that way. For others who have not found their themes yet, I'd like them to focus on something at

hand even for the time being, by suppressing their mind that is indecisively wandering this or that way.

As students, you may have to deal with many things aside from academic learning. But please remember to concentrate on something especially when you are at a loss of what to do or which way to go. I'm sure that by doing so you will have a moment when things formerly in question get interrelated with each other and emerge as something convincing before your eyes. I'd like all my students to capture such a moment.

◎ Just a word from a student ◎

● While in the general education course, my impression of Mr. Nozaki was one of a strict teacher. But this impression changed completely when I joined his lab. When I asked a question during research work, not only did he give me the correct solution, but he also explained step by step how to climb the stairs of understanding while encouraging us to think on our own. His approach often convinced me, the questioner, as well as other members of the seminar. Thanks to Mr. Nozaki's educational approach, it became possible for me to address and understand difficult challenges.

(Reporter & text writer: Kaoru Watanabe)

For the full text of this interview •

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**Concentrate to find a breakthrough,
especially when you are at a loss for which way to go.**

Yukio Nozaki

Mr. Nozaki's specialties are spin dynamics and spin electronics. His current research theme is the control of spin angular momentum dynamics that is strongly coupled, in ferromagnetic metals, with electronic and electron-phonon systems. He is developing his research work from basic research to applied research for practical applications. In 1998, after acquiring a doctorate (physics), he became a postdoctoral research assistant for Kyushu University's Graduate School and Faculty of Information Science and Electrical Engineering, assuming the position as an associate professor in 2006. In 2010, he assumed the current position as an associate professor for Department of Physics, Keio University Faculty of Science and Technology.

